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LED TV
SERVICE MANUAL

CHASSIS : LD32A

MODEL : 22MA33D 22MA33D-PZ(R)Q
24MN33D 24MN33D-PZ(R)Q

CAUTION
BEFORE SERVICING THE CHASSIS,
READ THE SAFETY PRECAUTIONS IN THIS MANUAL.

P/NO : MFL67714492 (1307-REV00)

Printed in Korea

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SAFETY PRECAUTIONS

IMPORTANT SAFETY NOTICE

Many electrical and mechanical parts in this chassis have special safety-related characteristics. These parts are identified by ⚠ in the Schematic Diagram and Exploded View.
It is essential that these special safety parts should be replaced with the same components as recommended in this manual to prevent Shock, Fire, or other Hazards.
Do not modify the original design without permission of manufacturer.

General Guidance

An isolation Transformer should always be used during the servicing of a receiver whose chassis is not isolated from the AC power line. Use a transformer of adequate power rating as this protects the technician from accidents resulting in personal injury from electrical shocks.

It will also protect the receiver and it's components from being damaged by accidental shorts of the circuitry that may be inadvertently introduced during the service operation.

If any fuse (or Fusible Resistor) in this TV receiver is blown, replace it with the specified.

When replacing a high wattage resistor (Oxide Metal Film Resistor, over *1W*), keep the resistor 10mm away from PCB.

Keep wires away from high voltage or high temperature parts.

Before returning the receiver to the customer,

always perform an AC leakage current check on the exposed metallic parts of the cabinet, such as antennas, terminals, etc., to be sure the set is safe to operate without damage of electrical shock.

Leakage Current Cold Check(Antenna Cold Check)

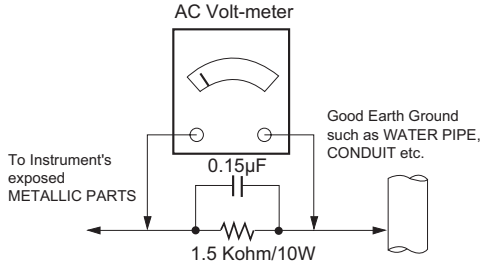
With the instrument AC plug removed from AC source, connect an electrical jumper across the two AC plug prongs. Place the AC switch in the on position, connect one lead of ohm-meter to the AC plug prongs tied together and touch other ohm-meter lead in turn to each exposed metallic parts such as antenna terminals, phone jacks, etc.
If the exposed metallic part has a return path to the chassis, the measured resistance should be between 1MΩ and 5.2MΩ.
When the exposed metal has no return path to the chassis the reading must be infinite.
An other abnormality exists that must be corrected before the receiver is returned to the customer.

Leakage Current Hot Check (See below Figure)

Plug the AC cord directly into the AC outlet.

Do not use a line Isolation Transformer during this check.
Connect 1.5K/10watt resistor in parallel with a 0.15uF capacitor between a known good earth ground (Water Pipe, Conduit, etc.) and the exposed metallic parts.
Measure the AC voltage across the resistor using AC voltmeter with 1000 ohms/volt or more sensitivity.
Reverse plug the AC cord into the AC outlet and repeat AC voltage measurements for each exposed metallic part. Any voltage measured must not exceed 0.75 volt RMS which is corresponds to 0.5mA.
In case any measurement is out of the limits specified, there is possibility of shock hazard and the set must be checked and repaired before it is returned to the customer.

Leakage Current Hot Check circuit



When 25A is impressed between Earth and 2nd Ground for 1 second, Resistance must be less than 0.1
*Base on Adjustment standard

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SERVICING PRECAUTIONS

CAUTION: Before servicing receivers covered by this service manual and its supplements and addenda, read and follow the SAFETY PRECAUTIONS on page 3 of this publication.
NOTE: If unforeseen circumstances create conflict between the following servicing precautions and any of the safety precautions on page 3 of this publication, always follow the safety precautions. Remember: Safety First.

General Servicing Precautions

1. Always unplug the receiver AC power cord from the AC power source before;
   a. Removing or reinstalling any component, circuit board module or any other receiver assembly.
   b. Disconnecting or reconnecting any receiver electrical plug or other electrical connection.
   c. Connecting a test substitute in parallel with an electrolytic capacitor in the receiver.
      CAUTION: A wrong part substitution or incorrect polarity installation of electrolytic capacitors may result in an explosion hazard.

2. Test high voltage only by measuring it with an appropriate high voltage meter or other voltage measuring device (DVM, FETVOM, etc) equipped with a suitable high voltage probe.
   Do not test high voltage by "drawing an arc".
3. Do not spray chemicals on or near this receiver or any of its assemblies.
4. Unless specified otherwise in this service manual, clean electrical contacts only by applying the following mixture to the contacts with a pipe cleaner, cotton-tipped stick or comparable non-abrasive applicator; 10% (by volume) Acetone and 90% (by volume) isopropyl alcohol (90%-99% strength)
   CAUTION: This is a flammable mixture.
   Unless specified otherwise in this service manual, lubrication of contacts in not required.
5. Do not defeat any plug/socket B+ voltage interlocks with which receivers covered by this service manual might be equipped.
6. Do not apply AC power to this instrument and/or any of its electrical assemblies unless all solid-state device heat sinks are correctly installed.
7. Always connect the test receiver ground lead to the receiver chassis ground before connecting the test receiver positive lead.
   Always remove the test receiver ground lead last.
8. Use with this receiver only the test fixtures specified in this service manual.
   CAUTION: Do not connect the test fixture ground strap to any heat sink in this receiver.

Electrostatically Sensitive (ES) Devices

Some semiconductor (solid-state) devices can be damaged easily by static electricity. Such components commonly are called Electrostatically Sensitive (ES) Devices. Examples of typical ES devices are integrated circuits and some field-effect transistors and semiconductor "chip" components. The following techniques should be used to help reduce the incidence of component damage caused by static by static electricity.

1. Immediately before handling any semiconductor component or semiconductor-equipped assembly, drain off any electrostatic charge on your body by touching a known earth ground. Alternatively, obtain and wear a commercially available discharging wrist strap device, which should be removed to prevent potential shock reasons prior to applying power to the unit under test.
2. After removing an electrical assembly equipped with ES devices, place the assembly on a conductive surface such as aluminum foil, to prevent electrostatic charge buildup or exposure of the assembly.
3. Use only a grounded-tip soldering iron to solder or unsolder ES devices.
4. Use only an anti-static type solder removal device. Some solder removal devices not classified as "anti-static" can generate electrical charges sufficient to damage ES devices.
5. Do not use freon-propelled chemicals. These can generate electrical charges sufficient to damage ES devices.
6. Do not remove a replacement ES device from its protective package until immediately before you are ready to install it. (Most replacement ES devices are packaged with leads electrically shorted together by conductive foam, aluminum foil or comparable conductive material).
7. Immediately before removing the protective material from the leads of a replacement ES device, touch the protective material to the chassis or circuit assembly into which the device will be installed.
   CAUTION: Be sure no power is applied to the chassis or circuit, and observe all other safety precautions.
8. Minimize bodily motions when handling unpackaged replacement ES devices. (Otherwise harmless motion such as the brushing together of your clothes fabric or the lifting of your foot from a carpeted floor can generate static electricity sufficient to damage an ES device.)

General Soldering Guidelines

1. Use a grounded-tip, low-wattage soldering iron and appropriate tip size and shape that will maintain tip temperature within the range or 500 ˚F to 600 ˚F.
2. Use an appropriate gauge of RMA resin-core solder composed of 60 parts tin/40 parts lead.
3. Keep the soldering iron tip clean and well tinned.
4. Thoroughly clean the surfaces to be soldered. Use a mall wire-bristle (0.5 inch, or 1.25cm) brush with a metal handle.
   Do not use freon-propelled spray-on cleaners.
5. Use the following unsoldering technique
   a. Allow the soldering iron tip to reach normal temperature. (500 ˚F to 600 ˚F)
   b. Heat the component lead until the solder melts.
   c. Quickly draw the melted solder with an anti-static, suction-type solder removal device or with solder braid.
      CAUTION: Work quickly to avoid overheating the circuit board printed foil.
6. Use the following soldering technique.
   a. Allow the soldering iron tip to reach a normal temperature (500 ˚F to 600 ˚F)
   b. First, hold the soldering iron tip and solder the strand against the component lead until the solder melts.
   c. Quickly move the soldering iron tip to the junction of the component lead and the printed circuit foil, and hold it there only until the solder flows onto and around both the component lead and the foil.
      CAUTION: Work quickly to avoid overheating the circuit board printed foil.
   d. Closely inspect the solder area and remove any excess or splashed solder with a small wire-bristle brush.

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IC Remove/Replacement

Some chassis circuit boards have slotted holes (oblong) through which the IC leads are inserted and then bent flat against the circuit foil. When holes are the slotted type, the following technique should be used to remove and replace the IC. When working with boards using the familiar round hole, use the standard technique as outlined in paragraphs 5 and 6 above.

Removal

1. *Desolder and straighten each IC lead in one operation by gently prying up on the lead with the soldering iron tip as the solder melts.*
2. *Draw away the melted solder with an anti-static suction-type solder removal device (or with solder braid) before removing the IC.*

Replacement

1. *Carefully insert the replacement IC in the circuit board.*
2. *Carefully bend each IC lead against the circuit foil pad and solder it.*
3. *Clean the soldered areas with a small wire-bristle brush. (It is not necessary to reapply acrylic coating to the areas).*

"Small-Signal" Discrete Transistor

Removal/Replacement

1. *Remove the defective transistor by clipping its leads as close as possible to the component body.*
2. *Bend into a "U" shape the end of each of three leads remaining on the circuit board.*
3. *Bend into a "U" shape the replacement transistor leads.*
4. *Connect the replacement transistor leads to the corresponding leads extending from the circuit board and crimp the "U" with long nose pliers to insure metal to metal contact then solder each connection.*

Power Output, Transistor Device

Removal/Replacement

1. *Heat and remove all solder from around the transistor leads.*
2. *Remove the heat sink mounting screw (if so equipped).*
3. *Carefully remove the transistor from the heat sink of the circuit board.*
4. *Insert new transistor in the circuit board.*
5. *Solder each transistor lead, and clip off excess lead.*
6. *Replace heat sink.*

Diode Removal/Replacement

1. *Remove defective diode by clipping its leads as close as possible to diode body.*
2. *Bend the two remaining leads perpendicular y to the circuit board.*
3. *Observing diode polarity, wrap each lead of the new diode around the corresponding lead on the circuit board.*
4. *Securely crimp each connection and solder it.*
5. *Inspect (on the circuit board copper side) the solder joints of the two "original" leads. If they are not shiny, reheat them and if necessary, apply additional solder.*

Fuse and Conventional Resistor

Removal/Replacement

1. *Clip each fuse or resistor lead at top of the circuit board hollow stake.*
2. *Securely crimp the leads of replacement component around notch at stake top.*
3. *Solder the connections.*

CAUTION: Maintain original spacing between the replaced component and adjacent components and the circuit board to prevent excessive component temperatures.

Circuit Board Foil Repair

Excessive heat applied to the copper foil of any printed circuit board will weaken the adhesive that bonds the foil to the circuit board causing the foil to separate from or "lift-off" the board. The following guidelines and procedures should be followed whenever this condition is encountered.

At IC Connections

To repair a defective copper pattern at IC connections use the following procedure to install a jumper wire on the copper pattern side of the circuit board. (Use this technique only on IC connections).

1. *Carefully remove the damaged copper pattern with a sharp knife. (Remove only as much copper as absolutely necessary).*
2. *carefully scratch away the solder resist and acrylic coating (if used) from the end of the remaining copper pattern.*
3. *Bend a small "U" in one end of a small gauge jumper wire and carefully crimp it around the IC pin. Solder the IC connection.*
4. *Route the jumper wire along the path of the out-away copper pattern and let it overlap the previously scraped end of the good copper pattern. Solder the overlapped area and clip off any excess jumper wire.*

At Other Connections

Use the following technique to repair the defective copper pattern at connections other than IC Pins. This technique involves the installation of a jumper wire on the component side of the circuit board.

1. *Remove the defective copper pattern with a sharp knife. Remove at least 1/4 inch of copper, to ensure that a hazardous condition will not exist if the jumper wire opens.*
2. *Trace along the copper pattern from both sides of the pattern break and locate the nearest component that is directly connected to the affected copper pattern.*
3. *Connect insulated 20-gauge jumper wire from the lead of the nearest component on one side of the pattern break to the lead of the nearest component on the other side. Carefully crimp and solder the connections. CAUTION: Be sure the insulated jumper wire is dressed so the it does not touch components or sharp edges.*

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SPECIFICATION

NOTE : Specifications and others are subject to change without notice for improvement.

1. Application Range

This spec sheet is applied all of the TV used LD32A chassis.

2. Specification

Each part is tested as below without special appointment

1) Temperature : 25 ˚C ± 5 ˚C (77 ˚F ± 9 ˚F),
   CST : 40 ˚C ± 5 ˚C
2) Relative Humidity : 65 % ± 10 %
3) Power Voltage : Standard input voltage
   (100 V - 240 V ~, 50 / 60 Hz)
   · Standard Voltage of each products is marked by models
4) Specification and performance of each parts are followed each drawing and specification by part number in accordance with BOM.
5) The receiver must be operated for about 5 minutes prior to the adjustment.

3.Test method

1) Performance : LGE TV test method followed
2) Demanded other specification
   - Safety : CE,IEC specification
   - EMC : CE,IEC specification

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4. General specification

4.1. TV

No	Item	Specification	Remarks
1	Market	EU/CIS (PAL Market-37 Countries)	DTV & Analog (Total 37 countries) DTV (MPEG2/4, DVB-T) :37 countries UK/Italy/Germany/France/Spain/Sweden/Finland/Netherlands/ Belgium/Luxemburg/ Greece/Denmark/Czech/ Austria /Hungary/Swiss/Croatia/Turkey Norway/Slovenia/Poland/Ukraine/Portugal/Ireland/Morocco/ Latvia/Estonia/Lithania/Rumania/Bulgaria/Russia/Slovakia Bosnia/Serbia/Albania/Kazakhstan/Belarus *4 Country, Nordic option(EU model only) - Denmark , Finland, Norway, Sweden DTV (MPEG2/4, DVB-T2): 8 countries UK/Denmark/Sweden/Finland/Norway/Ireland/Ukraine/ Kazakhstan DTV (MPEG2/4, DVB-C): 37 countries UK/Italy/Germany/France/Spain/Sweden/Finland/Netherlands/ Belgium/Luxemburg/ Greece/Denmark/Czech/ Austria /Hungary/Swiss/Croatia/Turkey Norway/Slovenia/Poland/Ukraine/Portugal/Ireland/Morocco/ Latvia/Estonia/Lithania/Rumania/Bulgaria/Russia/Slovakia Bosnia/Serbia/Albania/Kazakhstan/Belarus DTV (MPEG2/4,DVB-S): 29 countries Italy/Germany/France/Spain/Netherlands/ Belgium/ Luxemburg/ Greece/ Czech/Austria /Hungary/Swiss/Croatia/ Turkey/Slovenia/Poland/Portugal/ Morocco/Latvia/ Estonia/Lithuania/Rumania/Bulgaria/Russia/Slovakia Bosnia/Serbia/Albania/ Belarus Supported satellite : 22 satellites HISPASAT 1C/1D, ATLANTIC BIRD 2, NILESAT 101/102, ATLANTIC BIRD 3, AMOS 2/3, THOR 5/6, IRIUS 4, EUTELSAT-W3A, EUROBIRD 9A, EUTELSAT-W2A, HOTBIRD 6/8/9, EUTELSAT-SESAT, ASTRA 1L/H/M/KR, ASTRA 3A/3B, BADR 4/6, ASTRA 2D, EUROBIRD 3, EUTELSAT-W7, HELLASSAT 2, EXPRESS AM1, TURKSAT 2A/3A, INTERSAT10
2	Broadcasting system	1)Analogue TV 1) PAL-BG 2) PAL-DK 3) PAL-I/I' 4) SECAM-BG 5) SECAM-DK 6) SECAM L/L' Digital TV 1) DVB-T/C/T2 Satellite Digital TV 1) DVB-T/C/S/S2	Analogue TV (RF) VHF: E2 to E12, UHF : E21 to E69 (CATV) S1 to S20, HYPER: S21 to S47 Digital TV : VHF, UHF Satellite TV : VHF, UHF, C-Band, Ku-Band * DVB-T2 (T2 model only support) * DVB-S/S2 (Satellite model only support)

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No	Item	Specification	Remarks
3	Receiving system	Analog : Upper Heterodyne Digital : COFDM, QAM	► DVB-T - Guard Interval(Bitrate_Mbit/s) 1/4, 1/8, 1/16, 1/32 - Modulation : Code Rate QPSK : 1/2, 2/3, 3/4, 5/6, 7/8 16-QAM : 1/2, 2/3, 3/4, 5/6, 7/8 64-QAM : 1/2, 2/3, 3/4, 5/6, 7/8 ► DVB-T2 - Guard Interval(Bitrate_Mbit/s) 1/4, 1/8, 1/16, 1/32, 1/128, 19/128, 19/256, - Modulation : Code Rate QPSK : 1/2, 2/5, 2/3, 3/4, 5/6 16-QAM : 1/2, 2/5, 2/3, 3/4, 5/6 64-QAM : 1/2, 2/5, 2/3, 3/4, 5/6 256-QAM : 1/2, 2/5, 2/3, 3/4, 5/6 ► DVB-C - Symbolrate : 4.0Msymbols/s to 7.2Msymbols/s - Modulation : 16QAM, 64-QAM, 128-QAM and 256-QAM ► DVB-S/S2 - symbolrate DVB-S2 (8PSK / QPSK) : 2 ~ 45Msymbol/s DVB-S (QPSK) : 2 ~ 45Msymbol/s - viterbi DVB-S mode : 1/2, 2/3, 3/4, 5/6, 7/8 DVB-S2 mode : 1/2, 2/3, 3/4, 3/5, 4/5, 5/6, 8/9, 9/10
4	Scart Jack (1EA)	PAL, SECAM	Scart Jack is Full scart and support RF-OUT(analog)
5	Component Input (1EA)	Y/Cb/Cr , Y/Pb/Pr	
6	CVBS Input (1EA)	PAL, SECAM, NTSC	4 System(Rear) :PAL, SECAM, NTSC, PAL60 CVBS Video input is used by common port with Component.
7	RGB Input	RGB-PC	Analog (D-SUB 15Pin)
8	HDMI Input (1EA)	HDMI	Rear / HDMI version 1.4/ support PC Support HDCP
9	USB (1EA)	Picture, Music, Movie, SVC	Software Update + Picture + Music + Movie
10	DVB	DVB-T	CI : UK, Finland, Denmark, Norway, Sweden, Russia, Spain, Ireland, Luxemburg, Belgium, Netherland CI+ : France(Canal+), Italy(DGTVi)
		DVB-C	CI : Switzerland, Austria, Slovenia, Hungary, Bulgaria CI+: Switzerland(UPC,Cablecom), Netherland(Ziggo), Germany(KDG,CWB), Finland(labwise)
		DVB-S	CI + : Germany (Astra HD+)
11	Local Key (Touch)	⌄ ⌃ – + OK SETTINGS INPUT ⏻/I	
12	LAN JACK	Modular	2xMN33V, 2xMA33V(Only UK for MHEG)

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4.2. RGB/HDMI(PC) Specification

No	Item	Specification			Remarks
1	Supported Sync. Type	Separate Sync., Digital			
2	Operating Frequency	Analog	Horizontal	30 ~ 61 kHz	
			Vertical	56 ~ 75 Hz	
		Digital	Horizontal	30 ~ 61 kHz	
			Vertical	56 ~ 75 Hz	
3	Resolution	Analog	Max.	1366x768 @ 60 Hz	
			Recommend	1366x768 @ 60 Hz	
		Digital	Max.	1366x768 @ 60 Hz	
			Recommend	1366x768 @ 60 Hz	
4	Operating Environment	Temp : 10 ˚C ~ 35 ˚C Humidity : 20 % ~ 80 %			
5	Storage Environment	Temp : -10 ˚C ~ 60 ˚C non condensing Humidity : 5 % ~ 90 % non condensing			

5. Timing

5.1. RGB/ HDMI (PC)

No.	Resolution	H-freq(kHz)	V-freq(Hz)	Pixel clock(MHz)	Remark
1	720*400	31.468	70.080	28.321	
2	640*480	31.469	59.940	25.175	
3	640*480	37.500	75.000	31.500	
4	800*600	37.879	60.317	40.000	
5	800*600	46.875	75.000	49.500	
6	1024*768	48.363	60.004	65.000	
7	1024*768	60.023	75.029	78.750	
8	1280*800	49.702	59.810	83.500	
9	1366*768	47.717	59.79	85.5	

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5.2. HDMI (DTV)

No.	Resolution	H-freq(kHz)	V-freq(Hz)	Pixel clock(MHz)	Remark
1	720* 480	31.469 / 31.5	59.94 / 60	27.00/ 27.03	SDTV 480P
2	720*576	31.25	50.00	27.864	SDTV 576P
3	1280*720	37.50	50.00	74.250	HDTV 720P
4	1280* 720	44.96 / 45	59.94 / 60	74.17/ 74.25	HDTV 720P
5	1920* 1080	33.72 / 33.75	59.94 / 60	74.17/ 74.25	HDTV 1080I
6	1920* 1080	28.125	50.00	74.25	HDTV 1080I
7	1920* 1080	27.00	24	74.25	HDTV 1080P
8	1920* 1080	33.75	30.00	74.25	HDTV 1080P
9	1920* 1080	56.250	50	148.5	HDTV 1080P
10	1920* 1080	67.43 / 67.5	59.94 / 60	148.35/ 148.50	HDTV 1080P

5.3. Component

No	Specification				Remark
	Resolution	H-freq(kHz)	V-freq(Hz)	Pixel clock(MHz)	
1	720* 480	15.73	59.94	13.500	SDTV, DVD 480I(525I)
2	720* 480	15.75	60.00	13.514	SDTV, DVD 480I(525I)
3	720* 576	15.625	50.00	13.500	SDTV, DVD 576I(625I) 50Hz
4	720* 480	31.47	59.94	27.000	SDTV 480P
5	720* 480	31.50	60.00	27.027	SDTV 480P
6	720* 576	31.25	50.00	27.000	SDTV 576P 50Hz
7	1280* 720	44.96	59.94	74.176	HDTV 720P
8	1280* 720	45.00	60.00	74.250	HDTV 720P
9	1280* 720	37.50	50.00	74.25	HDTV 720P 50Hz
10	1920* 1080	33.72	59.94	74.176	HDTV 1080I
11	1920* 1080	33.75	60.00	74.250	HDTV 1080I
12	1920* 1080	28.125	50.00	74.250	HDTV 1080I 50Hz
13	1920* 1080	56.25	50	148.5	HDTV 1080P
14	1920* 1080	67.432	59.94	148.350	HDTV 1080P
15	1920* 1080	67.5	60.00	148.5	HDTV 1080P

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ADJUSTMENT INSTRUCTION

1. Application Range

This document is applied to LD32A chassis TV which is manufactured in TV (or Monitor) Factory or is produced on the basis of this data.

2. Designation

1) The adjustment is according to the order which is designated and which must be followed, according to the plan which can be changed only on agreeing.
2) Power adjustment : Free Voltage.
3) Magnetic Field Condition: Nil.
4) Input signal Unit: Product Specification Standard.
5) Reserve after operation: Above 5 Minutes (Heat Run)
   Temperature : at 25 °C ± 5 °C
   Relative humidity : 65 % ± 10 %
   Input voltage : 220 V, 60 Hz
6) Adjustment equipments : Color Analyzer (CA-210 or CA-110), DDC Adjustment Jig equipment, SVC remote controller.
7) Push The "IN STOP KEY" – For memory initialization

Case1 : Software version up

1) After downloading S/W by USB , Multi-vision set will reboot automatically
2) Push "In-stop" key
3) Push "Power on" key
4) Function inspection
5) After function inspection, Push "In-stop" key.

Case2 : Function check at the assembly line

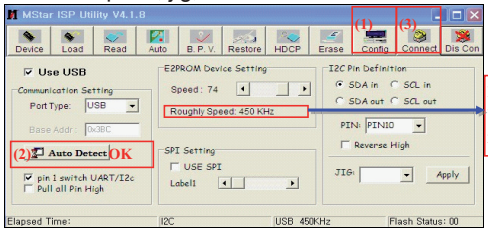
1) When TV set is entering on the assembly line, Push "In-stop" key at first.
2) Push "Power on" key for turning it on.
→ If you push "Power on" key, TV set will recover channel information by itself.
3) After function inspection, Push "In-stop" key.

3. Main PCB check process

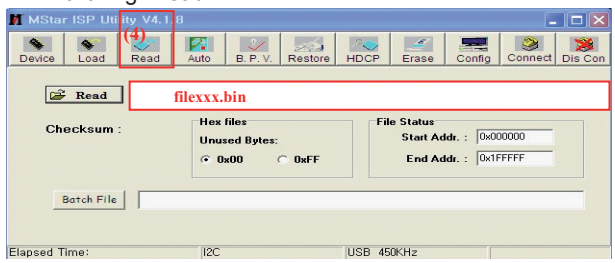
* APC - After Manual-Insult, executing APC

* Boot file Download

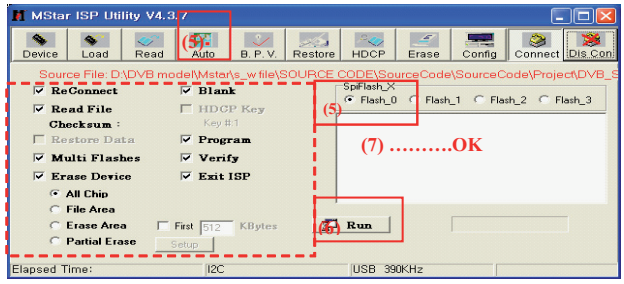
1) Execute ISP program “Mstar ISP Utility” and then click “Config” tab.
2) Set as below, and then click “Auto Detect” and check “OK” message. If display “Error”, Check connect computer, jig, and set.
3) Click “Connect” tab. If display “Can’t ”, Check connect computer, jig, and set.



4) Click “Read” tab, and then load download file(XXXX.bin) by clicking “Read”

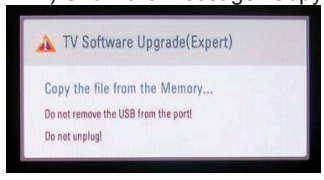


5) Click “Auto” tab and set as below
6) Click “Run”.
7) After downloading, check “OK” message.

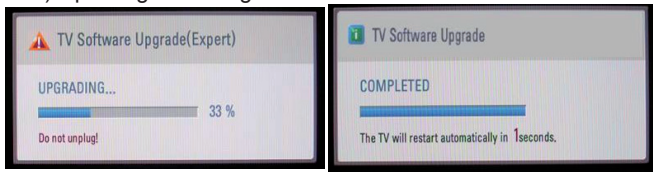


* USB DOWNLOAD(*.epk file download)

1) Make New folder named “LG_DTV” and put ISP file(*.epk) in the folder.
2) Put the USB Stick to the USB socket.
3) Automatically detecting update file in USB Stick
   - If your downloaded program version in USB Stick is Low, it didn’t work. But your downloaded version is High, USB data is automatically detecting.
4) Show the message “Copy the file from the Memory…”



5) Updating is starting.



6) Updating Completed, The TV will restart automatically.
7) If your TV is turned on, check your updated version and Tool option. (explain the Tool option, next stage)
   * If downloading version is more high than your TV have, TV can lost all channel data. In this case, you have to channel recover. if all channel data is cleared, you didn’t have a DTV/ATV test on production line.

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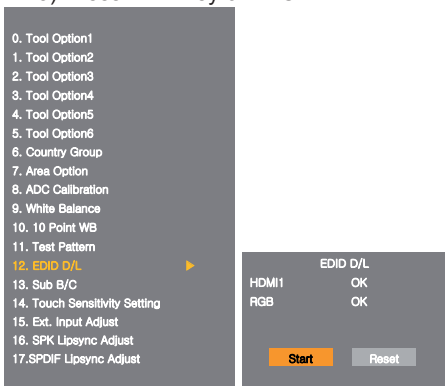
3.1. EDID Process

3.1.1. EDID download

1) Press "Power only" key of service remote control.
2) Press the ADJ KEY on R/C and enter EZ ADJUST
3) Enter EDID D/L mode by pushing "►" key at "EDID D/L".
4) EDID download is executed automatically.
5) Press EXIT key on R/C.



→ Caution: - Never connect HDMI & D-sub Cable when download EDID.
- Download HDMI1

* Edid data and Model option download (USB)

NO	Item	CMD 1	CMD 2	Data 0		
Enter download MODE	Download 'Mode In'	A	A	0	0	When transfer the 'Mode In', Carry the command.
EDID data and Model option download	Download	A	E	00	10	Automatically download (The use of a internal Data)

3.1.2. RGB EDID Data

- All Models (Product ID:22984/HEXA: 59C8)

128 B | Summary

	0x00	0x01	0x02	0x03	0x04	0x05	0x06	0x07	0x08	0x09	0x0A	0x0B	0x0C	0x0D	0x0E	0x0F
0x00	00	FF	FF	FF	FF	FF	FF	00	1E	6D	C8	59	01	01	01	01
0x01	01	17 *	**	01	03	68	33	1D	78	EA	62	75	A3	55	4F	A0	27
0x02	12	50	54	A7	6A	00	31	4F	45	4F	61	4F	81	00	01	01
0x03	01	01	01	01	01	01	66	21	56	AA	51	00	1E	30	46	8F
0x04	33	00	FD	1E	11	00	00	1E	00	00	00	FD	00	38	4B	1E
0x05	3D	09	00	0A	20	20	20	20	20	20	00	00	00	FC	00	32
0x06	44	20	48	44	20	4C	47	20	54	56	0A	20	00	00	00	FF
0x07	00	0A	20	20	20	20	20	20	20	20	20	20	20	20	00	B3 ***

*(week), **(year), ***(Check sum) : Adjustable Data
[ ]: Screen size, [ ]: Color Characteristics

3.1.3. HDMI EDID Data

- All Models (Product ID :22986/HEXA:59CA)

128 B | 256 B | Summary

	0x00	0x01	0x02	0x03	0x04	0x05	0x06	0x07	0x08	0x09	0x0A	0x0B	0x0C	0x0D	0x0E	0x0F
0x00	00	FF	FF	FF	FF	FF	FF	00	1E	6D	CA	59	01	01	01	01
0x01	01	17 *	***	01	03	80	33	1D	78	EA	62	75	A3	55	4F	A0	27
0x02	12	50	54	A7	6A	00	31	4F	45	4F	61	4F	81	00	01	01
0x03	01	01	01	01	01	01	66	21	56	AA	51	00	1E	30	46	8F
0x04	33	00	FD	1E	11	00	00	1E	00	00	00	FD	00	38	4B	1E
0x05	3D	09	00	0A	20	20	20	20	20	20	00	00	00	FC	00	32
0x06	44	20	48	44	20	4C	47	20	54	56	0A	20	00	00	00	FF
0x07	00	0A	20	20	20	20	20	20	20	20	20	20	20	20	01	98 ***

128 B | 256 B | Summary

	0x00	0x01	0x02	0x03	0x04	0x05	0x06	0x07	0x08	0x09	0x0A	0x0B	0x0C	0x0D	0x0E	0x0F
0x00	02	03	21	F1	4E	84	05	03	02	20	22	10	11	13	12	14
0x01	1F	07	16	26	15	07	50	09	07	07	66	03	0C	00	10 ****	00
0x02	80	01	1D	00	72	51	D0	1E	20	38	88	15	00	56	50	21
0x03	00	00	1E	01	1D	80	18	71	1C	16	20	58	2C	25	00	56
0x04	50	21	00	00	9E	01	1D	80	D0	72	1C	16	20	10	2C	25
0x05	80	C4	8E	21	00	00	9E	02	3A	80	D0	72	38	2D	40	10
0x06	2C	45	20	06	44	21	00	00	1E	02	3A	80	18	71	38	2D
0x07	40	58	2C	45	00	56	50	21	00	00	1E	00	00	00	00	CE ***

*(week), **(year), ***(Check sum) : Adjustable Data
**** (physical address) : (HDMI : 10),
****(Check sum) : (HDMI : CE)
[ ]: Screen size, [ ]: Color Characteristics

3.2. Function Check

3.2.1. Check display and sound

*Check Input and Signal items. (cf. work instructions)
1) TV
2) AV (SCART/CVBS)
3) COMPONENT (480i)
4) RGB(PC : 1366 x 768 @ 60 Hz)
5) HDMI(PC : 1366 x 768 @ 60Hz)
* Display and Sound check is executed by Remote controller

→ Caution : Not to push the INSTOP KEY after completion if the function inspection.

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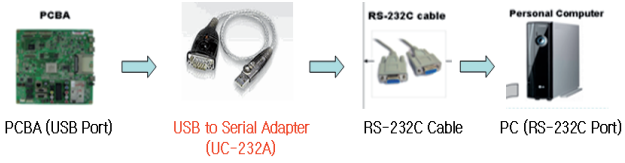
3.3. CI+ key writing process. (Device CN)

3.3.1. Download method

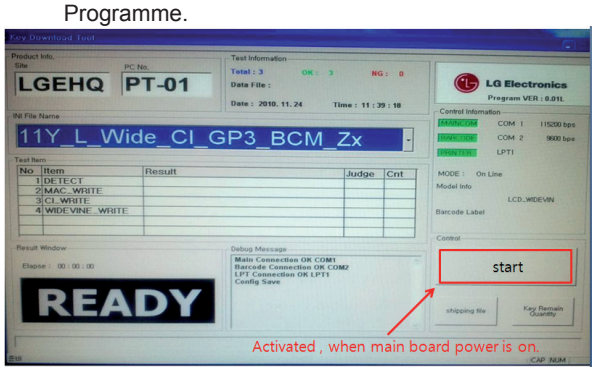
3.3.1.1. Communication Prot Connection



Connection : PCBA (USB Port) → USB to Serial Adapter (UC-232A) → RS-232C cable → PC(RS-232C port)
→ Caution : LD31Q/LD31A chassis support only UC-232A driver. (only use this one.)

3.3.2. CI+ Key Download

1) Set CI+ Key path Directory at Start Mac & CI+ Download Programme.

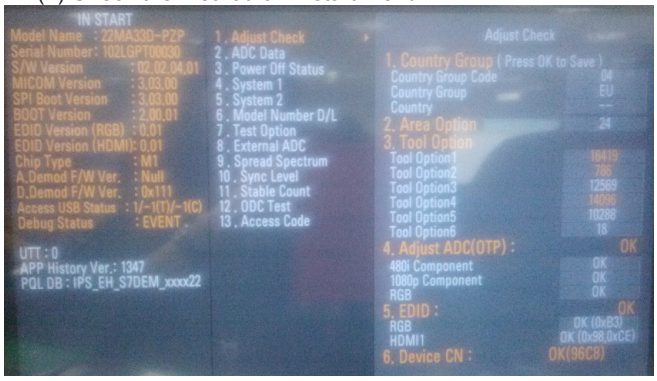


2) Set COM 1,2,3,4 / 115200(Baudrate) (1)/(2)
3) Click port connection button(1)
4) Start CI+ Key Download, Push the button(4)
5) Check OK or NG.
6) After completing download, CI + key values are increase by one automatically. To write CI+ key next SET, click CI+ key writing button(5) directly.
7) Check whether the key was downloaded or not at 'In Start' menu. (Refer to below).

→ Check the Download to CI+ Key value in LG set.

3.3.3. Check the method of CI+ Key value

(1) Check the method on Instart menu



(2) Check the method of RS232C Command

1) Into the main ass'y mode(RS232: aa 00 00)

CMD 1	CMD 2	Data 0	
A	A	0	0

2) Check the key download for transmitted command (RS232: ci 00 10)

CMD 1	CMD 2	Data 0	
C	I	1	0

3) Result value
- Normally status for download : OKx
- Abnormally status for download : NGx

3.3.4. Check the method of CI+ key value(RS232)

1) Into the main ass'y mode(RS232: aa 00 00)

CMD 1	CMD 2	Data 0	
A	A	0	0

2) Check the mothed of CI+ key by command (RS232: ci 00 20)

CMD 1	CMD 2	Data 0	
C	I	2	0

3) Result value
i 01 OK 1d1852d21c1ed5dcx
→ CI+ Key Value

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4. Total Assembly line process

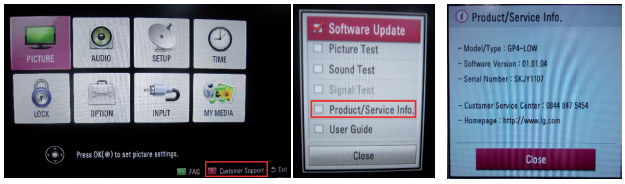
4.1. Tool option & ADC Check

1) Press "Power on" key of service remote control.
2) Connect USB Port → USB to Serial Adapter (UC-232A) → RS-232C cable → PC(RS-232C port)
3) Check the 'Tool Option' (Refer to the BOM Comments or Adjustment spec)
4) Check the 'ADC' is ok.

4.2. Model name & Serial number Down-load

4.2.1. Model name & Serial number D/L

1) Press "Power on" key of service remote control.
2) Connect USB Port → USB to Serial Adapter (UC-232A) → RS-232C cable → PC(RS-232C port)
3) Write Model Name & Serial Number by use USB Port
4) Must check the serial number at the Diagnostics of SET UP menu. (Refer to below).



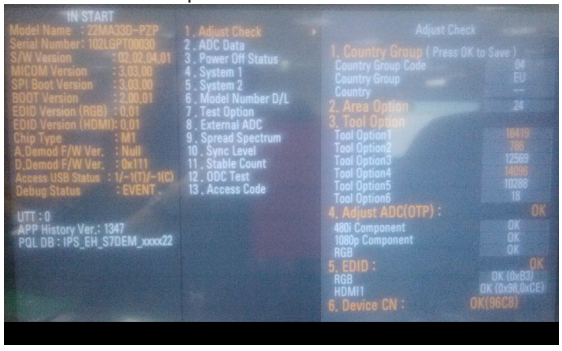
4.2.2. Method & notice

1) Model Name & Serial Number D/L is using of scan equip-ment.
2) Setting of scan equipment operated by Manufacturing Technology Group.
3) Serial number D/L must be conformed when it is produced in production line, because serial number D/L is mandatory by D-book 4.0

* Manual Download (Model Name and Serial Number)

If the TV set is downloaded By OTA or Service man, Some-times model name or serial number is initialized.(Not always) There is impossible to download by bar code scan, so It need Manual download.

1) Press the 'Instart' key of ADJ remote controller.
2) Go to the menu 'Model Number D/L' like below photo.
3) Input the Factory model name(ex 27MD73D-PZP) or Serial number like photo.



4) Check the model name Instart menu → Factory name displayed (ex 27MD73D-PZP)
5) Check the Diagnostics (DTV country only) → Buyer model displayed (ex 27MD73D-PZ)

4.3. Function Check

4.3.1. Check display and sound

*Check Input and Signal items. (cf. work instructions)
1) TV
2) AV (SCART/CVBS)
3) COMPONENT (480i)
4) RGB(PC : 1366 x 768 @ 60 Hz)
5) HDMI(PC : 1366 x 768 @ 60Hz)
* Display and Sound check is executed by Remote controller

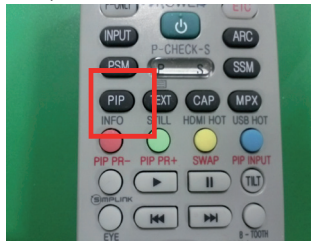
→ Caution : Not to push the INSTOP KEY after completion if the function inspection.

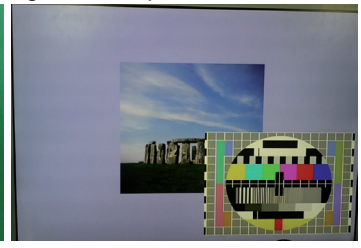
4.3.2. PCMCIA CARD Check

You must adjust DTV 29 Channel and insert PCMCIA CARD to socket.
- If PCMCIA CARD works normally, video signals will appear on screen.
But it works abnormally, "No CA module" will appear on screen.
→ Caution: Set up "RF mode" before launching products.

4.3.3. PIP Check

1) Press "Power on" key of service remote control.
2) Input RGB & TV(ATV or DTV) signal.
3) Set Input mode to RGB.
4) Press 'PIP" key of ADJ remote controller
5) Check TV Video & Audio signal of Sub picture.





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4.4. White balance adjustment

-Equipment

1) Color Analyzer: CA-210 (LED Module : CH 14)
2) Adj. Computer(During auto adj., RS-232C protocol is needed)
3) Adjust Remocon

RGB Gains are fixed data for each model.
Insert RS-232C Jack which is connected with PC for White Balance or equivalent device.

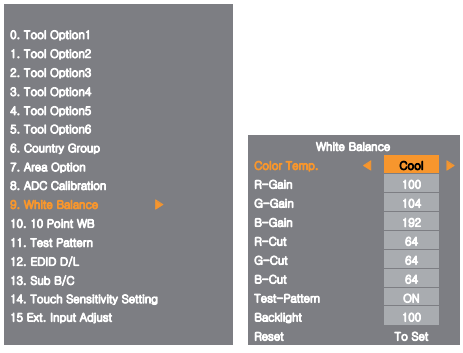
* Total Assembly line should be check whether the color coordinate(x,y) data refer to below table were meet or not.

Color Temperature	Cool	13,000	°K	X=0.276 (±0.03) Y=0.275 (±0.03)	<Test Signal> Inner pattern (204gray,80IRE)
	Medium	9,300	°K	X=0.290 (±0.03) Y=0.298 (±0.03)	
	Warm	6,500	°K	X=0.318 (±0.03) Y=0.334 (±0.03)	
Luminance (cd/m²)	Cool	Min : 80		Typ : 110	<Test Signal> Inner pattern (204gray,80IRE)
	Medium	Min : 80		Typ : 110	
	Warm	Min : 70		Typ : 110	

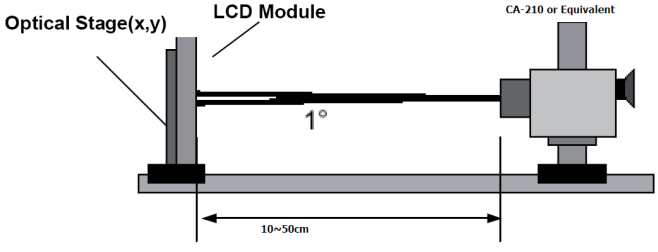
*Note : x,y coordinates are drifted about 0.007 after 30 mins heat-run. So checking color coordinate within 5-min at total assembly line, consider x,y coordinates might be up to 0.007 than x,y target of each color temperature.

*Note : Manual W/B process using adjusts Remote control.

1) After enter Service Mode by pushing "ADJ" key,
2) Enter "White Balance" by pushing "►" key at "White Balance".



* When doing Adjustment, Please make circumstance as below.



4.5. DPM Operation check

■ Measurement Condition: 100~240V@ 50/60Hz

1) Set Input to RGB-PC and connect D-sub cable to set – RGB Mode
   Set Input to HDMI (with Input Label set to PC) and connect HDMI cable to set – HDMI Mode
2) Cut off H sync or V sync of signal.
3) Check DPM operation refer to the below table.

Operating Condition		Sync (H/V)	Video	LED (SET)	Wattage (W)
Power S/W On	Sleep mode - RGB,HDMI	Off/Off	Off	Amber	1

4.6. Model Name & SW Version & Adjust check.

* Press the 'Instart' key of ADJ remote controller

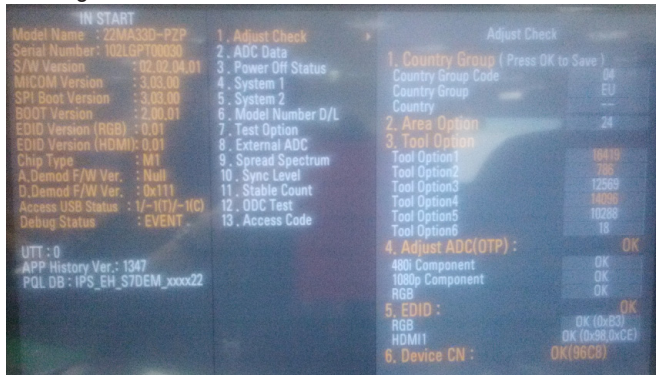
4.6.1. Model Name& SW Version Check

1) Check 'Model Name'.
2) Check 'S/W Version' (Refer to the IC Ver. in the BOM)

4.6.2. Adjust Check

1) Check 'Country Group'
2) Check 'Area Option'
3) Check 'Tool Option' (Refer to the BOM Comments)
4) Check 'Adjust ADC[Comp&RGB]' is OK.
5) Check 'EDID[RGB&HDMI]' is OK.

* After check all, Press the 'EXIT' key of ADJ remote controller to go out SVC menu.



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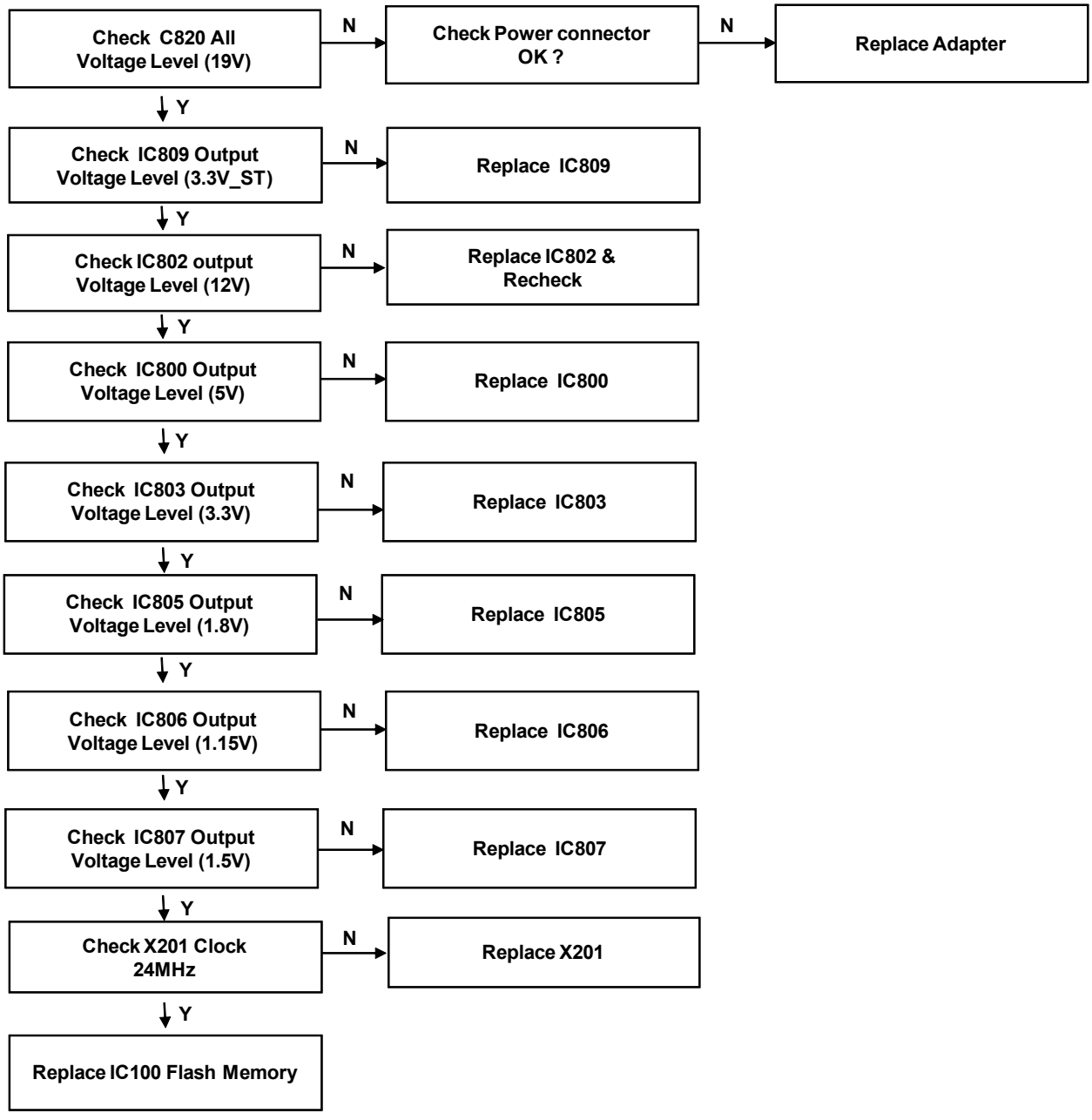
TROUBLE SHOOTING

1. No Power



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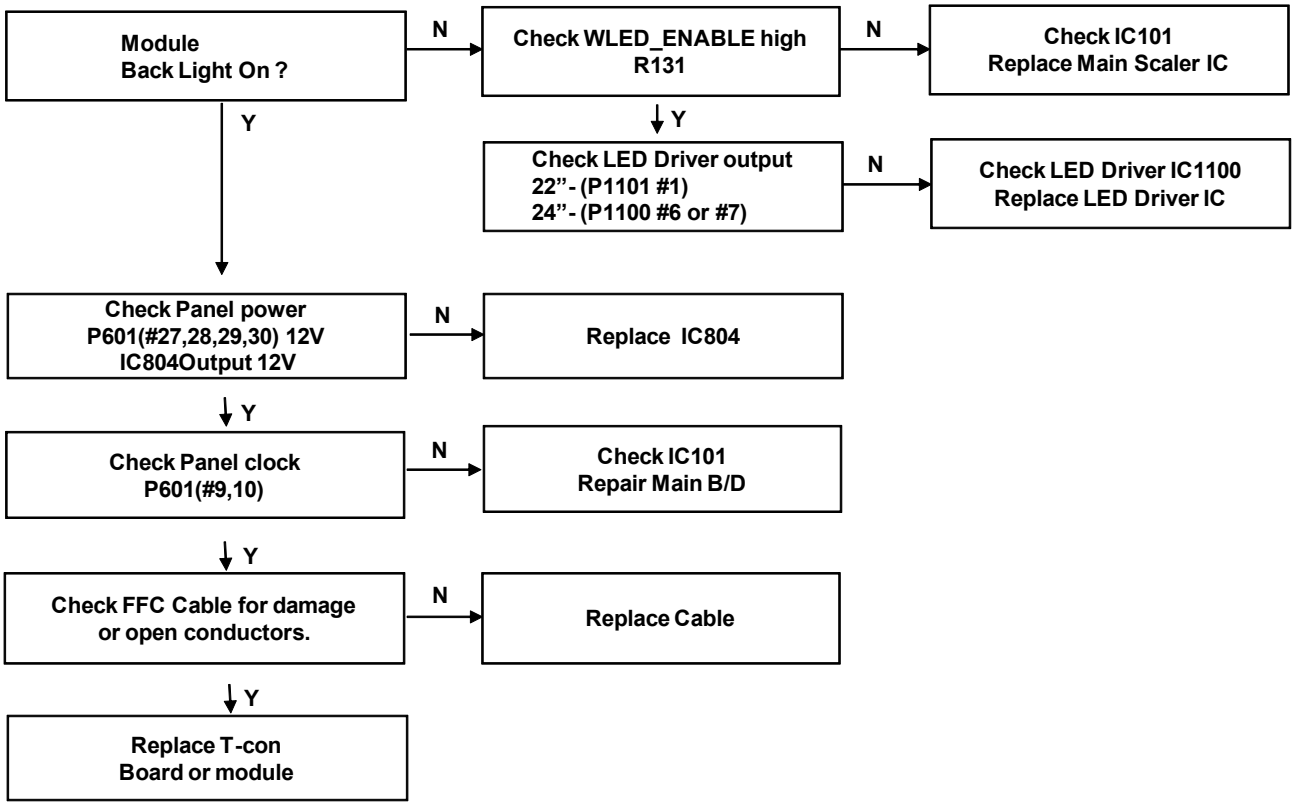
2. No Picture



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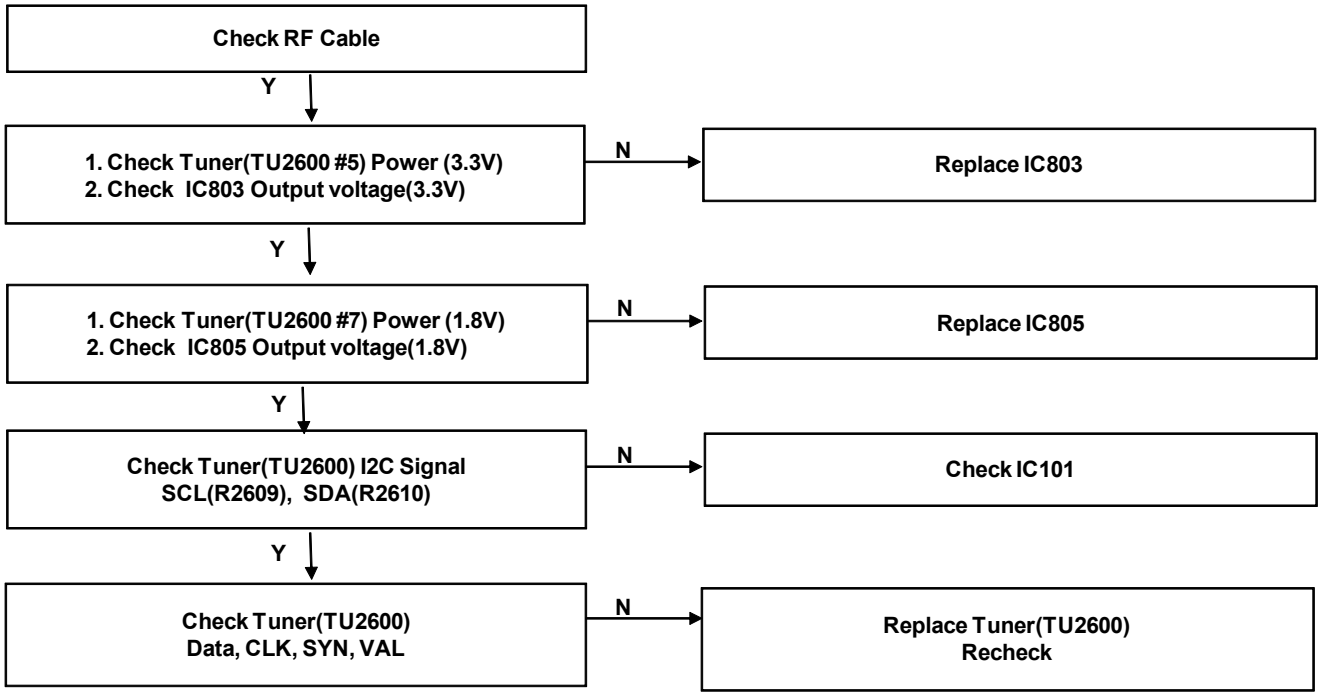
3. No Video - Digital TV



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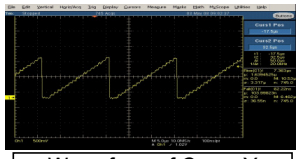
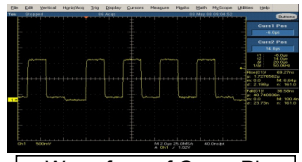
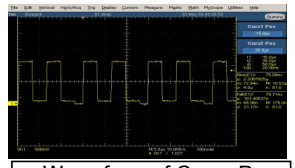
4. No Video - Component



Wave form of Comp Y



Wave form of Comp Pb



Wave form of Comp Pr

Check input signal format Is it supported?

Y

Check Component Cable

Y

Check JK2800

N → **Replace JK2800 or Check Device**

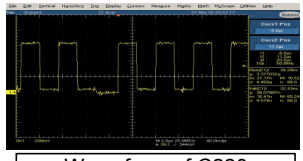
Y

Check signal R239,R237,R241 C220,C218,C222

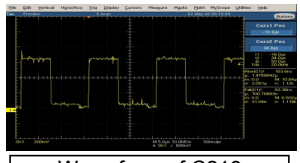
N → **Replace R239,R237,R241 C220,C218,C222**

Y

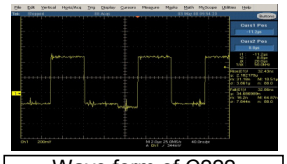
IC101 has problem



Wave form of C220



Wave form of C218



Wave form of C222

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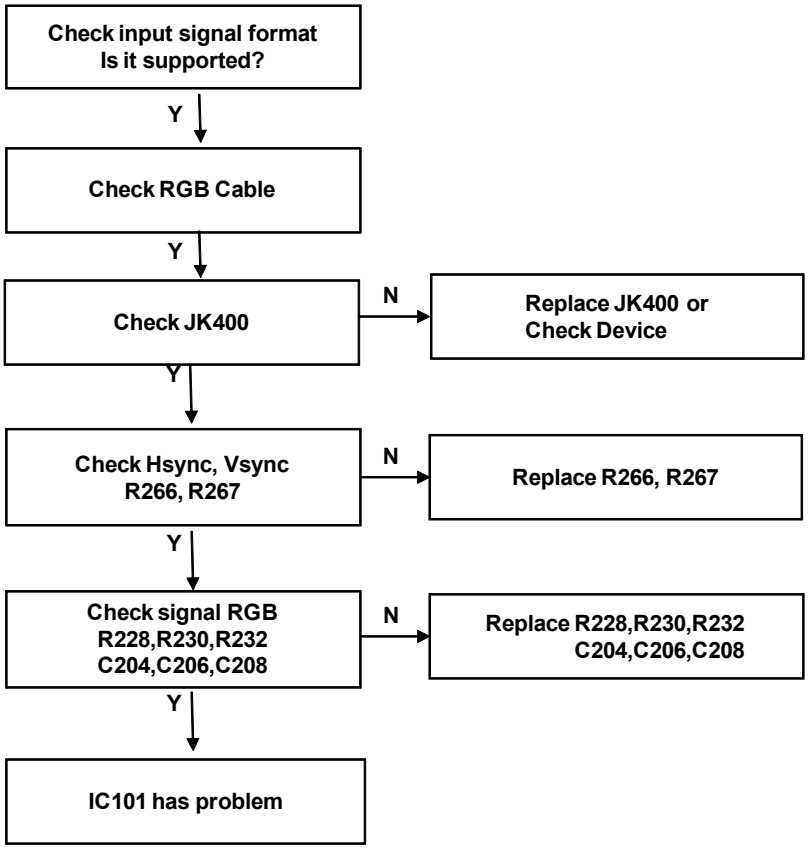
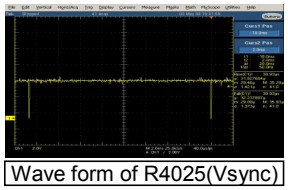
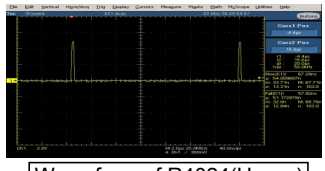
5. No Video - RGB

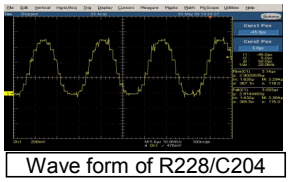




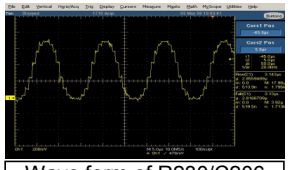
Wave form of R4025(Vsync)



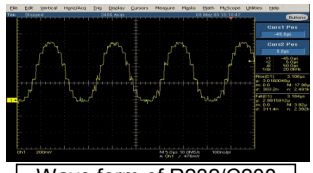
Wave form of R4024(Hsync)



Wave form of R228/C204



Wave form of R230/C206



Wave form of R232/C208

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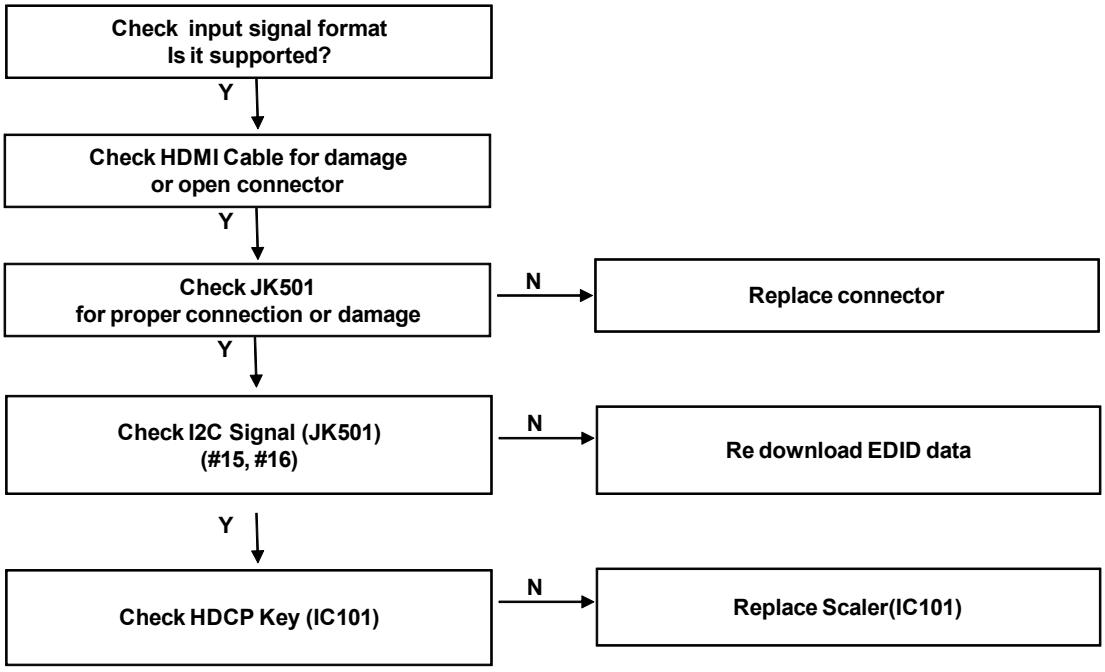
6. No Video - HDMI



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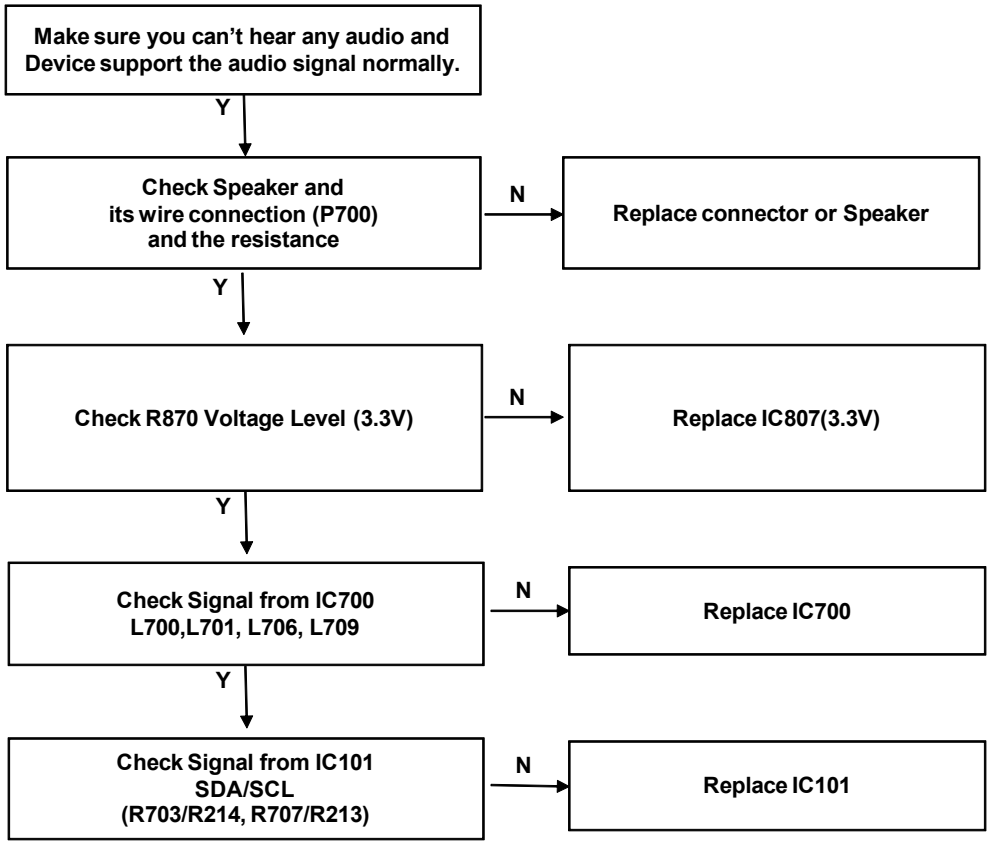
7. No Audio



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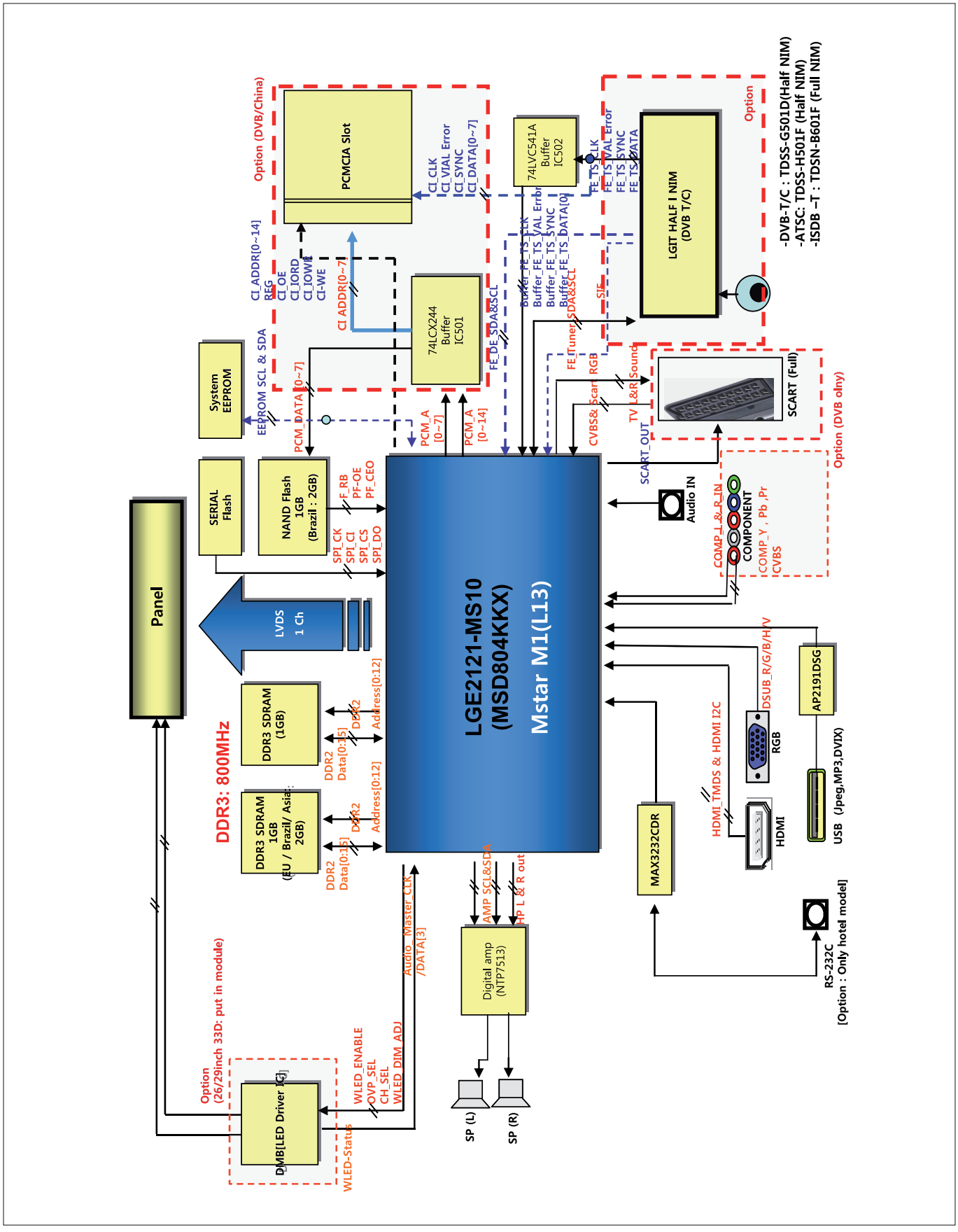
BLOCK DIAGRAM



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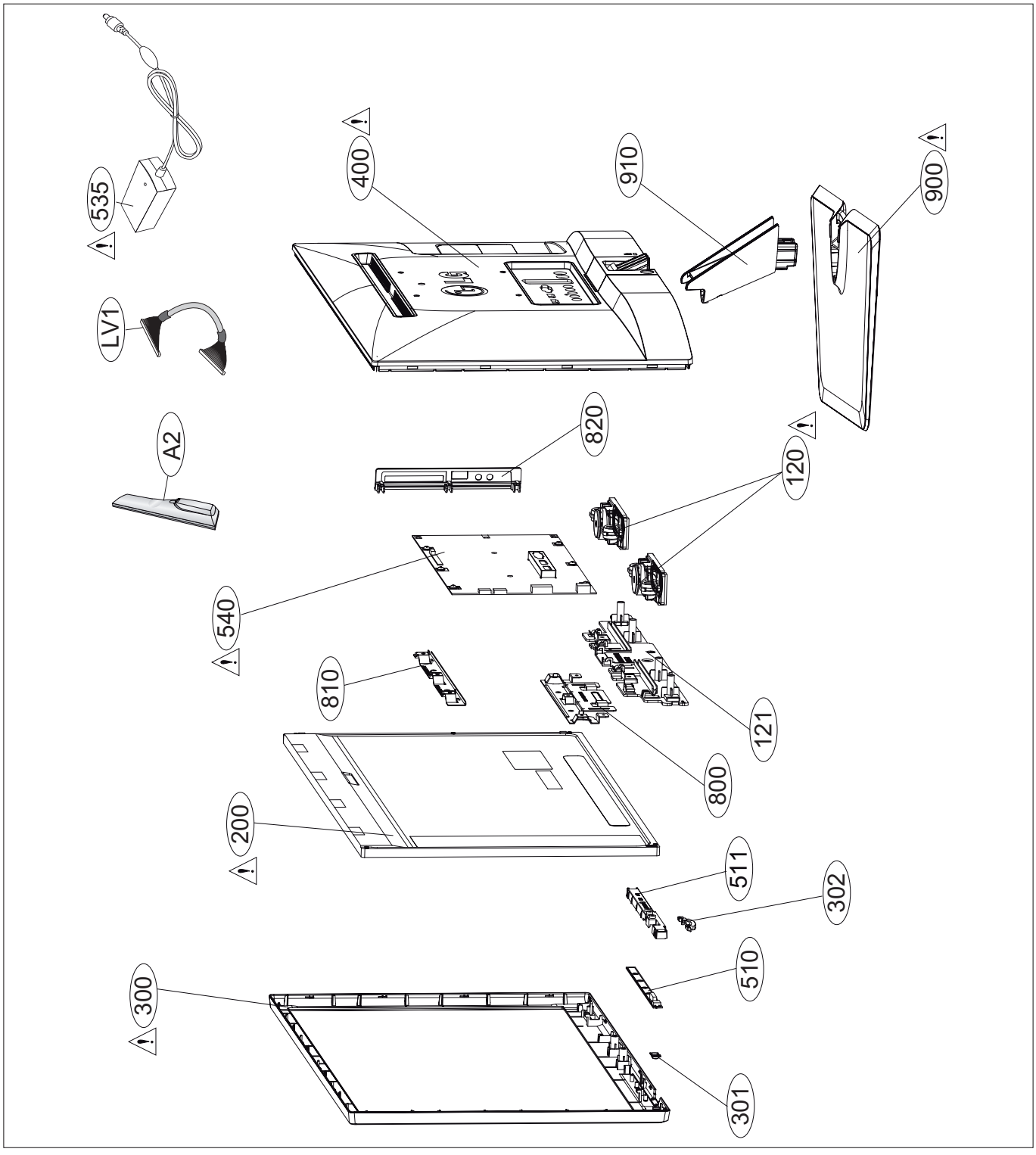
EXPLODED VIEW

IMPORTANT SAFETY NOTICE

Many electrical and mechanical parts in this chassis have special safety-related characteristics. These parts are identified by ⚠ in the Schematic Diagram and EXPLODED VIEW.
It is essential that these special safety parts should be replaced with the same components as recommended in this manual to prevent X-RADIATION, Shock, Fire, or other Hazards.
Do not modify the original design without permission of manufacturer.



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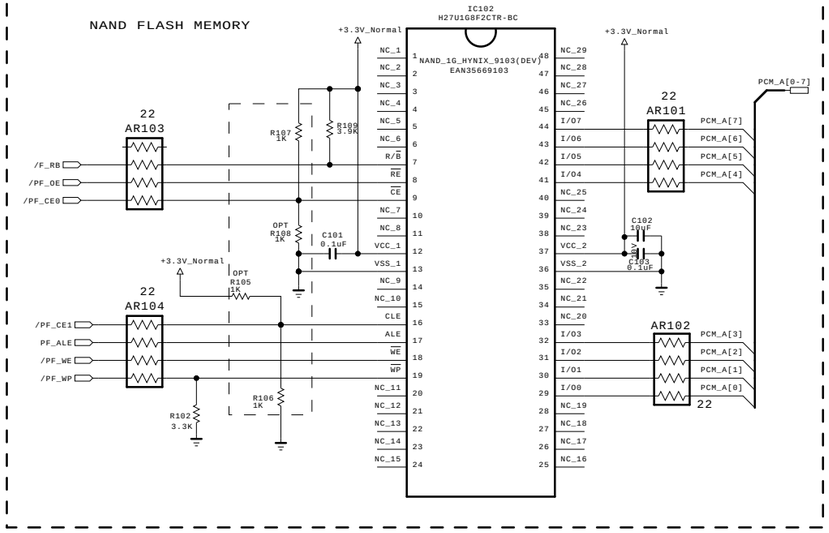
NAND FLASH MEMORY

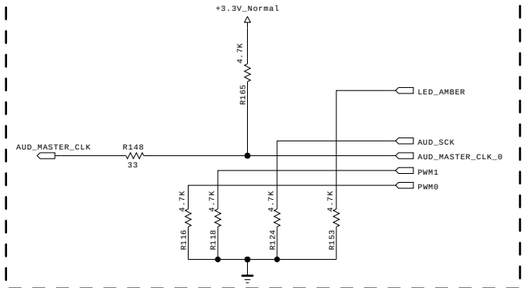


<CHIP Config(LED_R/BUZZ)>

Boot from SPI CS1N(EXT_FLASH) 1'b0
Boot from SPI_CS0N(INT_FLASH) 1'b1

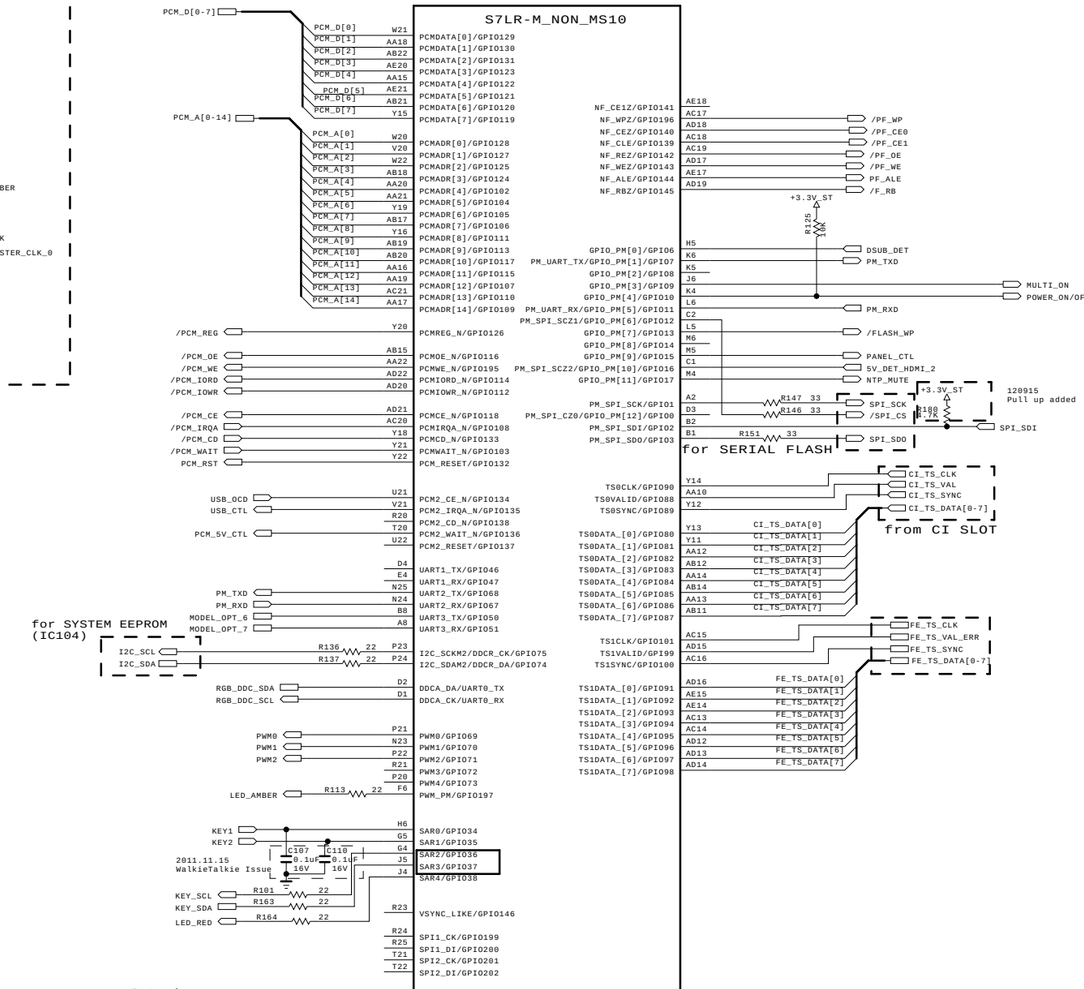
<CHIP Config>
(I2S_OUT_BCK,I2S_OUT_MCK,PAD_PWM1PAD_PWM0)

BS1_no_EJ	: 4'b0000	Boot from 8051 with SPI flash
SBS1_WOS	: 4'b0001	Secure 8S1 without scramble
SBS1_WS	: 4'b0010	Secure 8S1 with scramble
MIPS_SPE_NO_EJ	: 4'b0100	Boot from MIPS with SPI flash
MIPS_SPI_EJ_1	: 4'b0101	Boot from MIPS with SPI flash
MIPS_SPI_EJ_2	: 4'b0110	Boot from MIPS with SPI flash
MIPS_WOS	: 4'b1001	Secure MIPS without scramble
MIPS_WS	: 4'b1010	Scerur MIPS with SCRAMBLE



IC101
MSD804KKX

S7LR-M_NON_MS10



LGE2121-NonMS10 (MSD804KKX)
: EAN62651201 (KR/US REGION)

LGE2121-MS10 (MSD804KKX)
: EAN62674101 (NON_KR/US REGION)

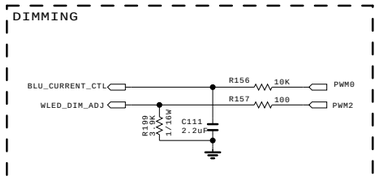
NAND_1G_SS
EAN61857001
IC102-*1
K9F1G08U0D-SCB0

NC_1 NC_2 NC_3 NC_4 NC_5 NC_6 R/B RE CE NC_7 NC_8 VCC_1 VSS_1 NC_9 NC_10 CLE ALE WE WP NC_11 NC_12 NC_13 NC_14 NC_15
NC_29 NC_28 NC_27 NC_26 I/O7 I/O6 I/O5 I/O4 NC_25 NC_24 NC_23 VCC_2 VSS_2 NC_22 NC_21 NC_20 I/O3 I/O2 I/O1 I/O0 NC_19 NC_18 NC_17 NC_16

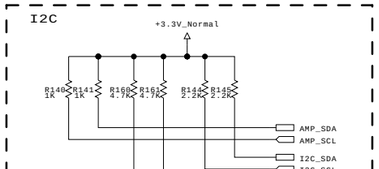
NAND_1G_NUMONYX(DEV)
EAN60762401
IC102-*2
NAND01GW3B2CN6E

NC_1 NC_2 NC_3 NC_4 NC_5 NC_6 R/B RE CE NC_7 VDD_1 VSS_1 NC_9 NC_10 CL AL WE WP NC_11 NC_12 NC_13 NC_14 NC_15
NC_29 NC_28 NC_27 NC_26 I/O7 I/O6 I/O5 I/O4 NC_25 NC_24 NC_23 VDD_2 VSS_2 NC_22 NC_21 NC_20 I/O3 I/O2 I/O1 I/O0 NC_19 NC_18 NC_17 NC_16

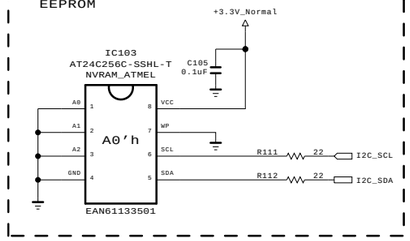
DIMMING

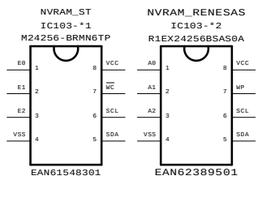


I2C

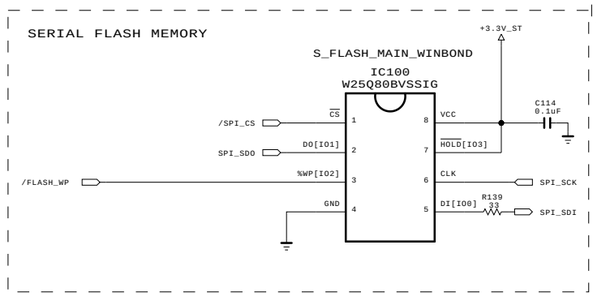


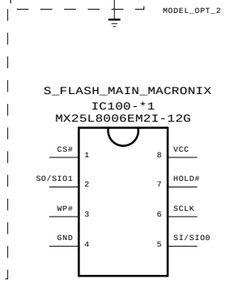
EEPROM





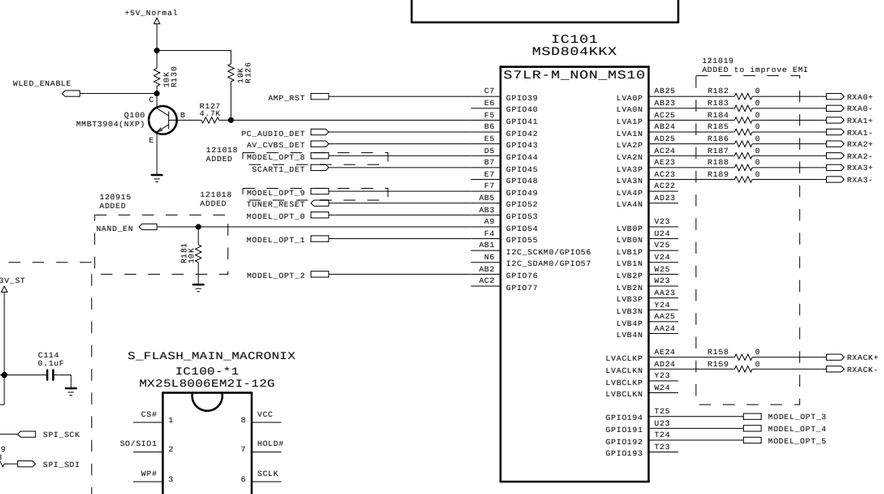
SERIAL FLASH MEMORY





IC101
MSD804KKX

S7LR-M_NON_MS10



THE ⚠ SYMBOL MARK OF THIS SCHEMETIC DIAGRAM INCORPORATES SPECIAL FEATURES IMPORTANT FOR PROTECTION FROM X-RADIATION. FILRE AND ELECTRICAL SHOCK HAZARDS, WHEN SERVICING IF IS ESSENTIAL THAT ONLY MANUFATURES SPECFIED PARTS BE USED FOR THE CRITICAL COMPONENTS IN THE ⚠ SYMBOL MARK OF THE SCHEMETIC.

SECRET
LGElectronics

LG ELECTRONICS

EAX65359601_EU_22"/24"/28"

MODEL	NC4_S7LRM	DATE	2013.05.25
BLOCK	MAIN1_EU	SHEET	1 / 12

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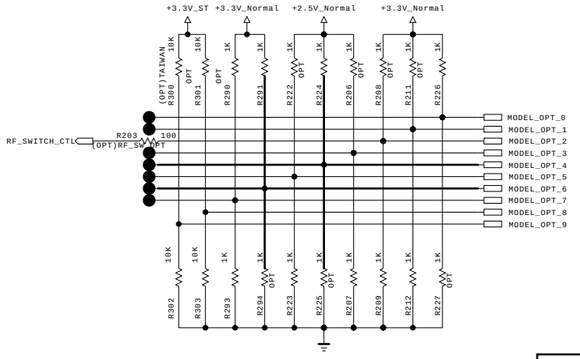
MODEL OPTION



PIN NAME	PIN NO	LOW	HIGH
MODEL_OPT_0	AB3	FHD	HD
MODEL_OPT_1	F4	NON_AJ	AJ
MODEL_OPT_2	AB2	NON_DVB_T2	DVB_T2
MODEL_OPT_3	T25	NON_M120	M120
MODEL_OPT_4	U23	MIU0-128M	MIU0-256M
MODEL_OPT_5	T24	NON_DVB_S	DVB_S
MODEL_OPT_6	B8	MIU1-NO_DDR	MIU1-128M
MODEL_OPT_7	A8	Dual Stream is only Korea 3D spec NON_DualStream	DualStream
MODEL_OPT_8	F7	HD_LVDS_EU	HD_LVDS_NON_EU
MODEL_OPT_9	A9	EU,AJ	TAIWAN

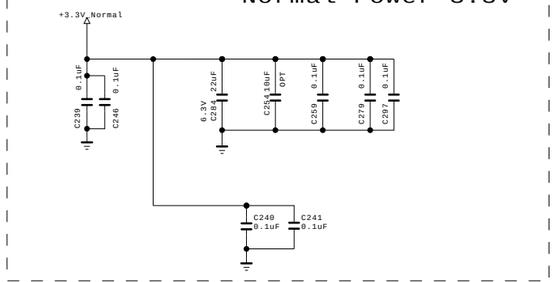
Other: N.C

MEMORY OPTION

Memory	Model OPT 4	Model OPT 6	Note
128M	0	0	
128M+128M	0	1	
256M	1	0	
256M+128M	1	1	Ginga

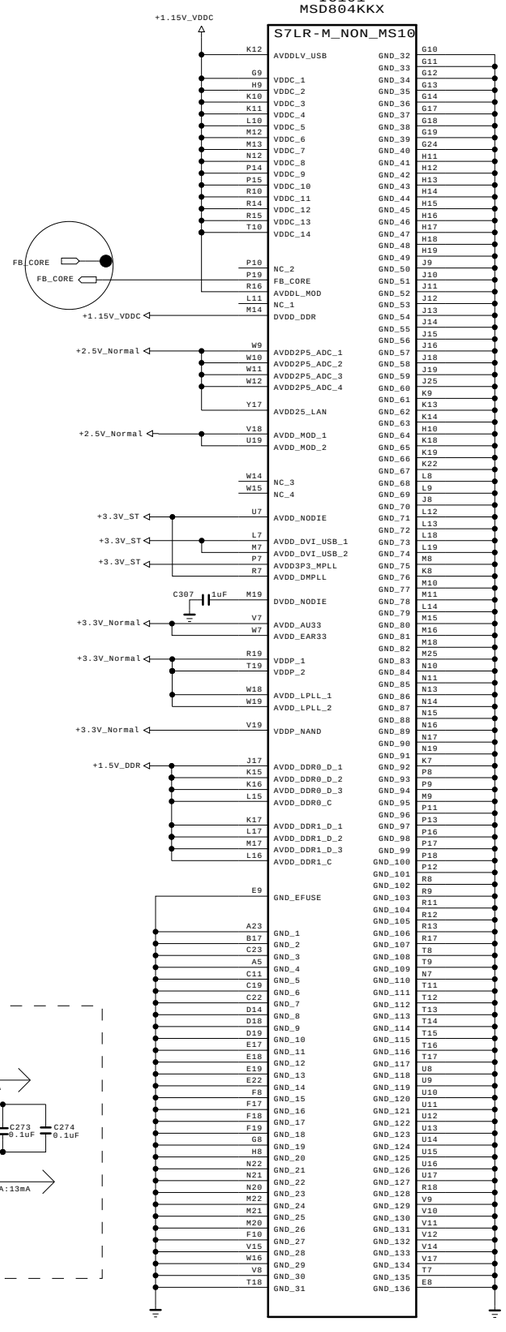
VDDC 1.15V

Normal Power 3.3V

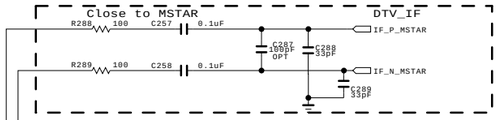


IC101 MSD804KKX

S7LR-M_NON_MS10

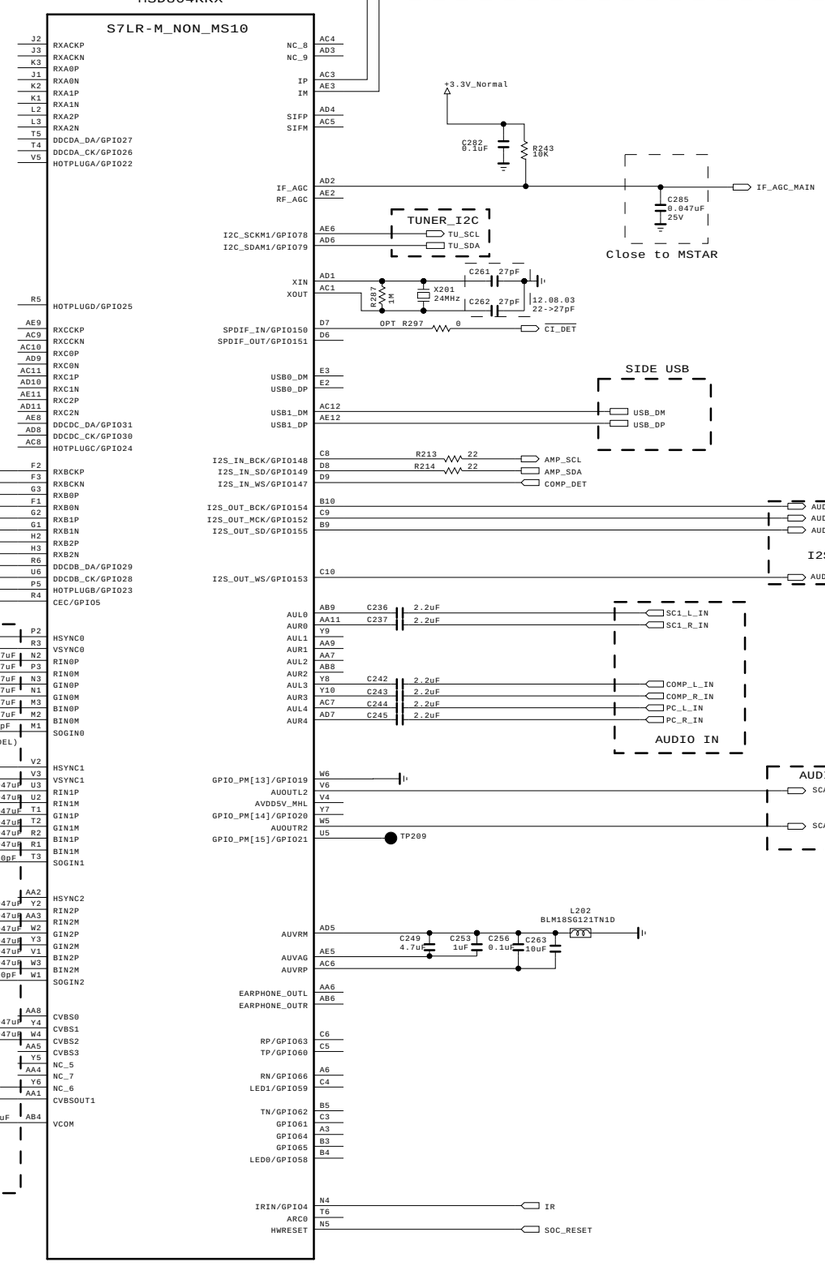

+1.15V_VDDC
FB_CORE
FB_CORE
+1.15V_VDDC
+2.5V_Normal
+2.5V_Normal
+3.3V_ST
+3.3V_ST
+3.3V_ST
C307 1uF
+3.3V_Normal
+3.3V_Normal
+3.3V_Normal
+1.5V_DDR
K12 AVDDLV_USB
G9 VDDC_1
H9 VDDC_2
K10 VDDC_3
K11 VDDC_4
L10 VDDC_5
M12 VDDC_6
M13 VDDC_7
N12 VDDC_8
P14 VDDC_9
P15 VDDC_10
R10 VDDC_11
R14 VDDC_12
R15 VDDC_13
T10 VDDC_14
P10 NC_2
P19 FB_CORE
R16 AVDDL_MOD
L11 NC_1
M14 DVDD_DDR
W9 AVDD2P5_ADC_1
W10 AVDD2P5_ADC_2
W11 AVDD2P5_ADC_3
W12 AVDD2P5_ADC_4
Y17 AVDD25_LAN
V18 AVDD_MOD_1
U19 AVDD_MOD_2
W14 NC_3
W15 NC_4
U7 AVDD_NODIE
L7 AVDD_DVI_USB_1
M7 AVDD_DVI_USB_2
P7 AVDD3P3_MPLL
R7 AVDD_DMPLL
M19 DVDD_NODIE
V7 AVDD_AU33
W7 AVDD_EAR33
R19 VDDP_1
T19 VDDP_2
V19 VDDP_NAND
J17 AVDD_DDR0_D_1
K15 AVDD_DDR0_D_2
K16 AVDD_DDR0_D_3
L15 AVDD_DDR0_C
K17 AVDD_DDR1_D_1
L17 AVDD_DDR1_D_2
M17 AVDD_DDR1_D_3
L16 AVDD_DDR1_C
E9 GND_EFUSE
A23 B17 C23 A5 C11 C19 C22 D14 D18 D19 E17 E18 E19 E22 F8 F19 G8 H8 N22 N21 M22 M21 M20 F10 V15 W16 V8 T18 GND_1 GND_2 GND_3 GND_4 GND_5 GND_6 GND_7 GND_8 GND_9 GND_10 GND_11 GND_12 GND_13 GND_14 GND_15 GND_16 GND_17 GND_18 GND_19 GND_20 GND_21 GND_22 GND_23 GND_24 GND_25 GND_26 GND_27 GND_28 GND_29 GND_30 GND_31
G10 G11 G12 G13 G14 G17 G18 G19 G24 H11 H12 H13 H14 H15 H16 H17 H18 H19 J9 J10 J11 J12 J13 J14 J15 J16 J18 J19 J25 K9 K13 K14 H10 K18 K19 K22 L8 L9 J8 L12 L13 L18 L19 M8 M10 M11 L14 M15 M16 M18 M25 N10 N11 N13 N14 N15 N16 N17 N19 K7 P8 P9 M9 P11 P13 P16 P17 P18 P12 R8 R9 R11 R12 R13 R17 T8 T9 N7 T11 T12 T13 T14 T15 T16 T17 U8 U9 U10 U11 U12 U13 U14 U15 U16 U17 R18 V9 V10 V11 V12 V14 V17 T7 E8
GND_32 GND_33 GND_34 GND_35 GND_36 GND_37 GND_38 GND_39 GND_40 GND_41 GND_42 GND_43 GND_44 GND_45 GND_46 GND_47 GND_48 GND_49 GND_50 GND_51 GND_52 GND_53 GND_54 GND_55 GND_56 GND_57 GND_58 GND_59 GND_60 GND_61 GND_62 GND_63 GND_64 GND_65 GND_66 GND_67 GND_68 GND_69 GND_70 GND_71 GND_72 GND_73 GND_74 GND_75 GND_76 GND_77 GND_78 GND_79 GND_80 GND_81 GND_82 GND_83 GND_84 GND_85 GND_86 GND_87 GND_88 GND_89 GND_90 GND_91 GND_92 GND_93 GND_94 GND_95 GND_96 GND_97 GND_98 GND_99 GND_100 GND_101 GND_102 GND_103 GND_104 GND_105 GND_106 GND_107 GND_108 GND_109 GND_110 GND_111 GND_112 GND_113 GND_114 GND_115 GND_116 GND_117 GND_118 GND_119 GND_120 GND_121 GND_122 GND_123 GND_124 GND_125 GND_126 GND_127 GND_128 GND_129 GND_130 GND_131 GND_132 GND_133 GND_134 GND_135 GND_136

Close to MSTAR / DTV_IF



IC101 MSD804KKX

S7LR-M_NON_MS10

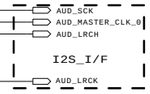


TUNER_I2C

Close to MSTAR

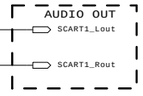
SIDE USB

I2S_I/F

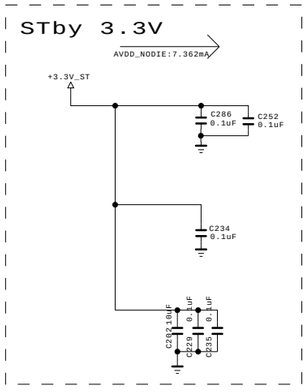


AUDIO IN

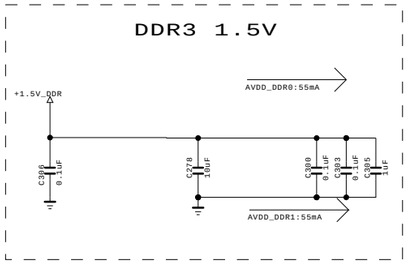
AUDIO OUT



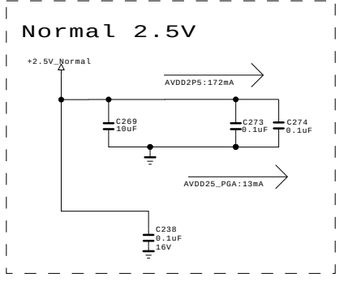
STby 3.3V



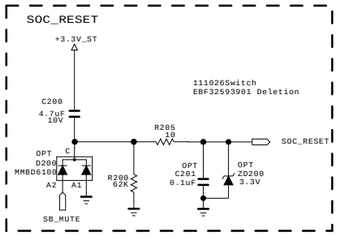
DDR3 1.5V



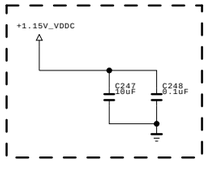
Normal 2.5V



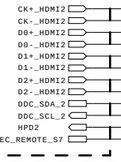
SOC_RESET



+1.15V_VDDC



HDMI



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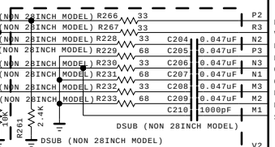
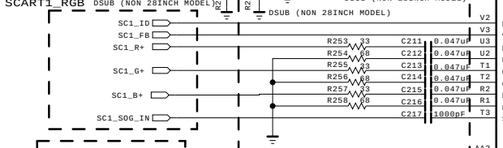
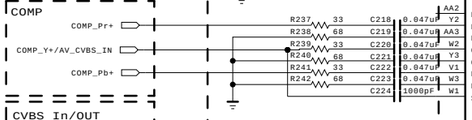


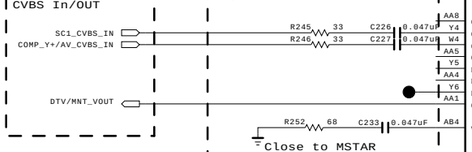
SCART1_RGB



COMP



CVBS In/OUT



TUNER

L202

THE ⚠ SYMBOL MARK OF THIS SCHEMETIC DIAGRAM INCORPORATES SPECIAL FEATURES IMPORTANT FOR PROTECTION FROM X-RADIATION. FILRE AND ELECTRICAL SHOCK HAZARDS, WHEN SERVICING IF IS ESSENTIAL THAT ONLY MANUFATURES SPECFIED PARTS BE USED FOR THE CRITICAL COMPONENTS IN THE ⚠ SYMBOL MARK OF THE SCHEMETIC.

SECRET

LGElectronics

LG ELECTRONICS

EAX65359601_EU_22"/24"/28"

MODEL	NC4_S7LRM	DATE	2013.05.06
BLOCK	MAIN2_EU	SHEET	2 / 12

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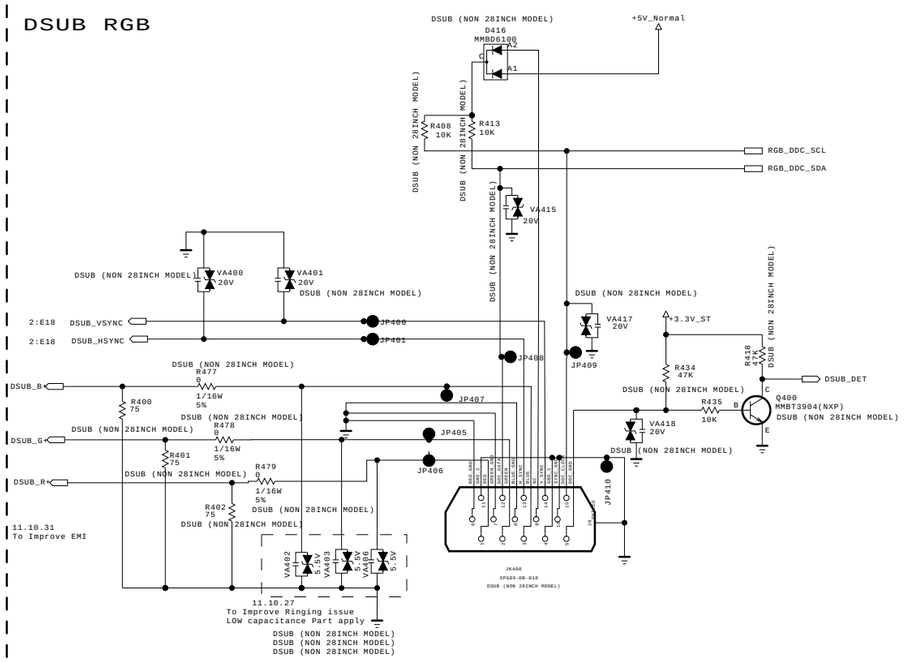
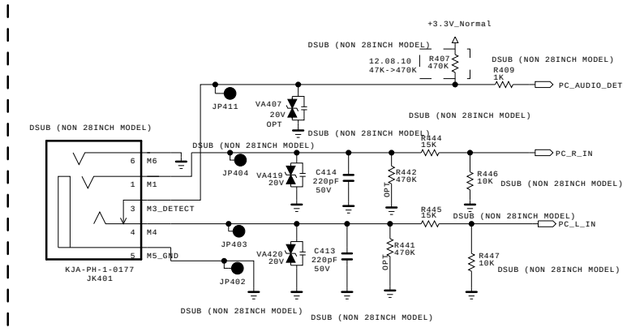
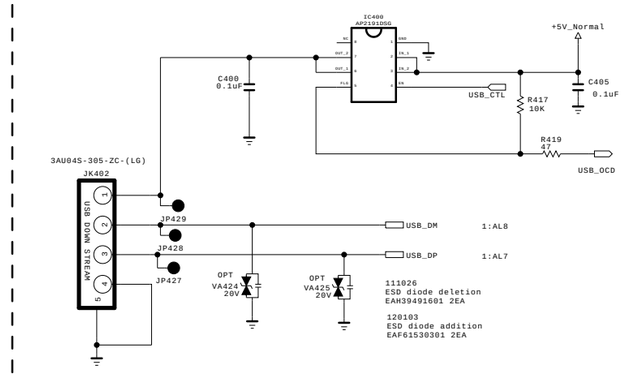
DSUB RGB



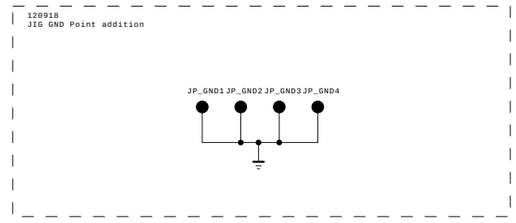
PC AUDIO(SIDE)



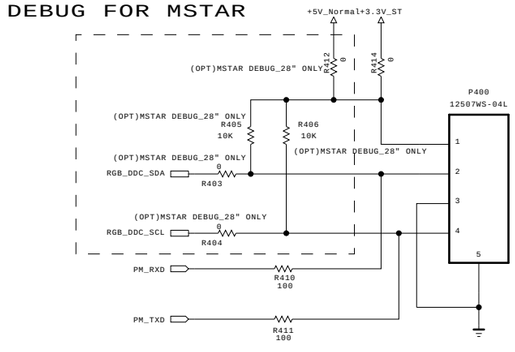
USB(SIDE)



Jack Shield (HDMI1, HDMI2, RGB)



DEBUG FOR MSTAR



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SECRET
LGElectronics

LG ELECTRONICS

EAX65359601_EU_22"/24"/28"

MODEL	NC4_S7LRM	DATE	2013.05.25
BLOCK	INTERFACE	SHEET	4 / 12

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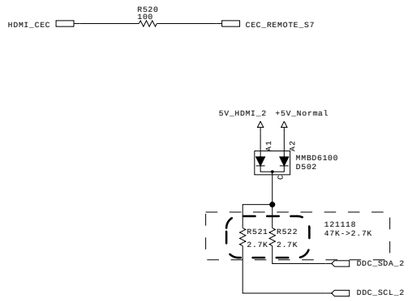
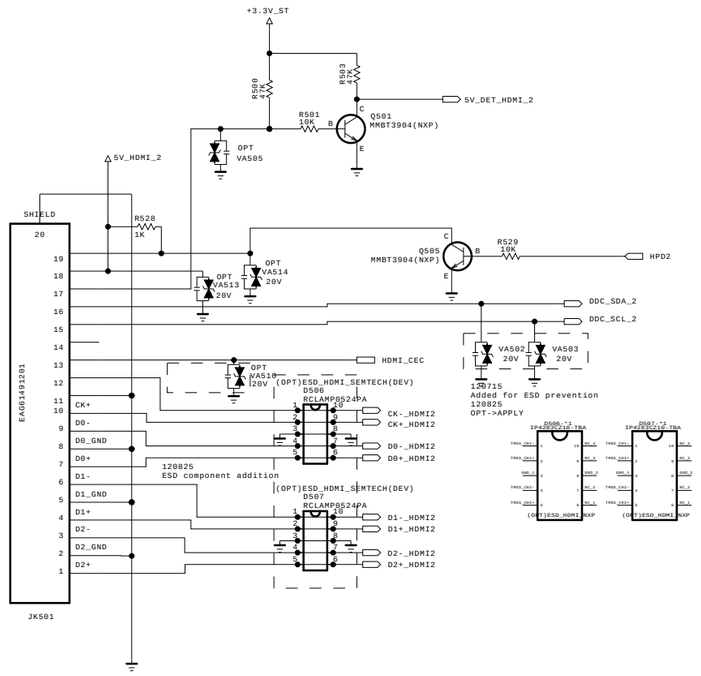
HDMI

CEC



HDMI_2 With MHL



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EAX65359601_EU_22"/24"/28"

MODEL	NC4_S7LRM	DATE	2013.05.25
BLOCK	HDMI	SHEET	5 / 12

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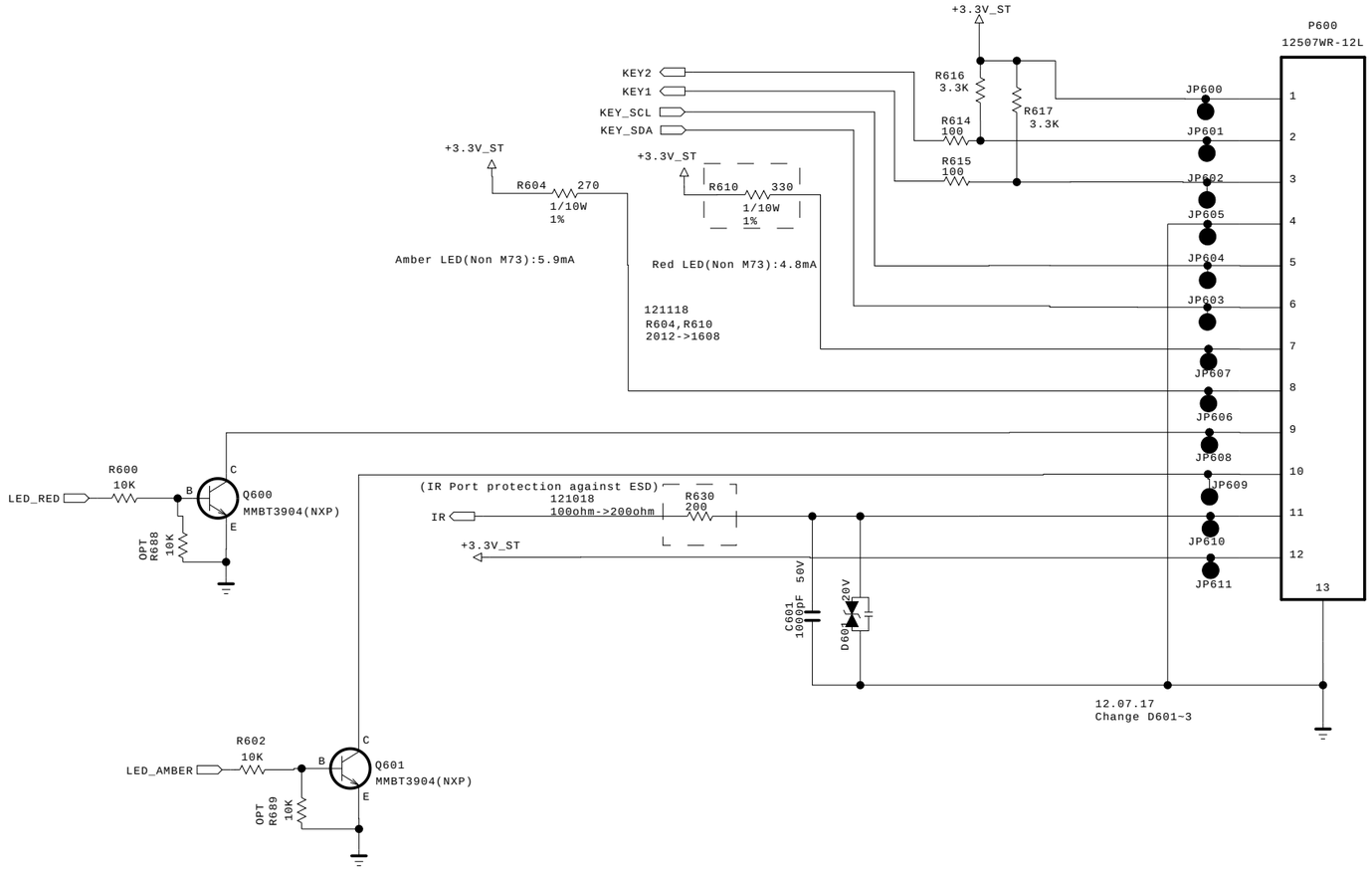
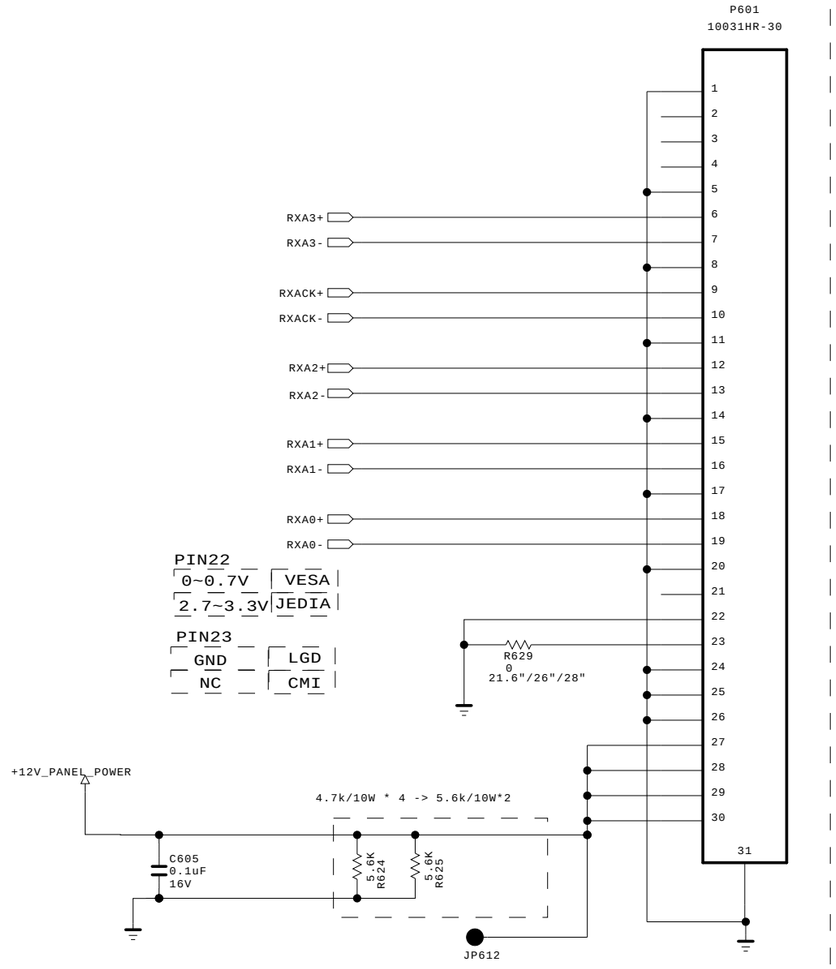
IR/LED and Control



Module



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EAX65359601_EU_22"/24"/28"

MODEL	NC4_S7LRM	DATE	2013.05.06
BLOCK	MODULE&CONTROL	SHEET	6 / 12

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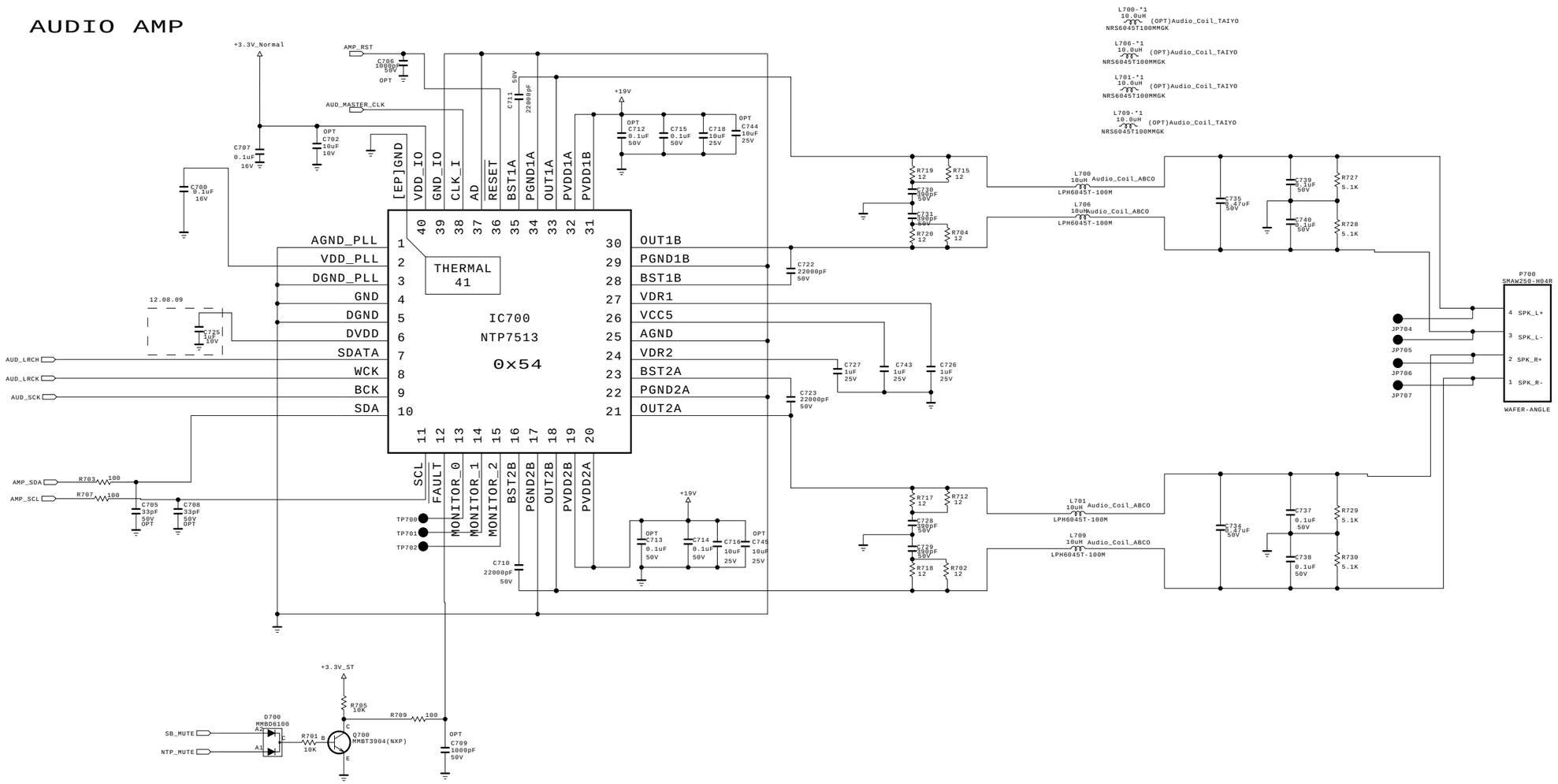
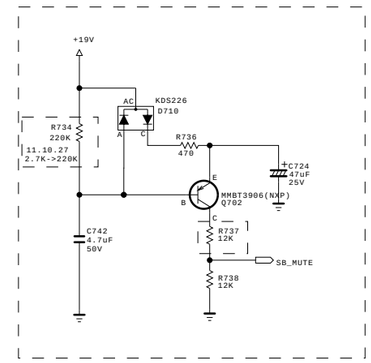
AUDIO AMP



19V DIP DETECTION



121118
R737 3K for SCART MUTE DEL
3K:
With SCART MUTE BLOCK

12K:
Without SCART MUTE BLOCK

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EAX65359601_EU_22"/24"/28"

MODEL	NC4_S7LRM	DATE	2013.05.25
BLOCK	AUDIO AMP	SHEET	7 / 12

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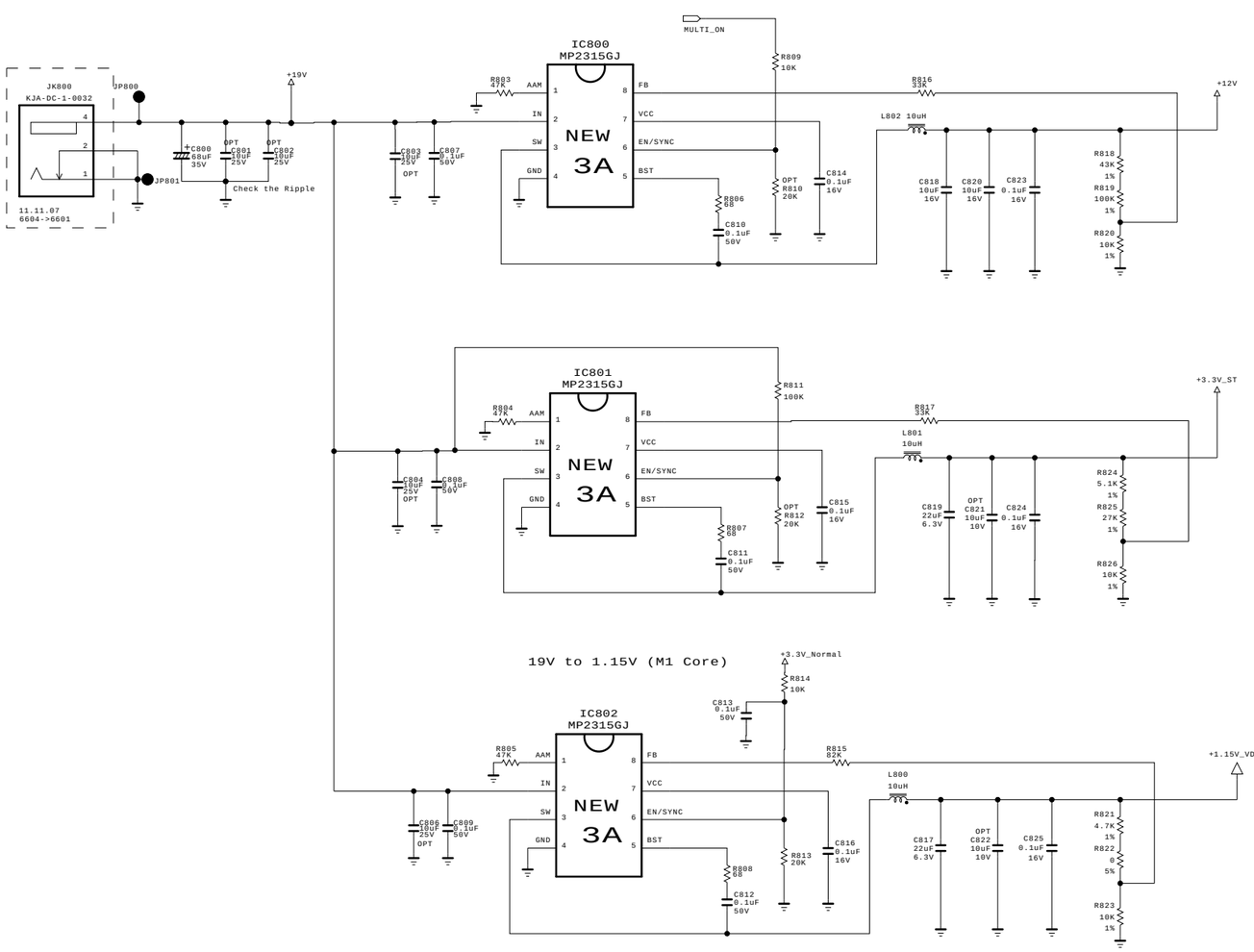

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EAX65359601_EU_22"/24"/28"

MODEL	NC4_S7LRM	DATE	2013.05.25
BLOCK	POWER	SHEET	8 / 12

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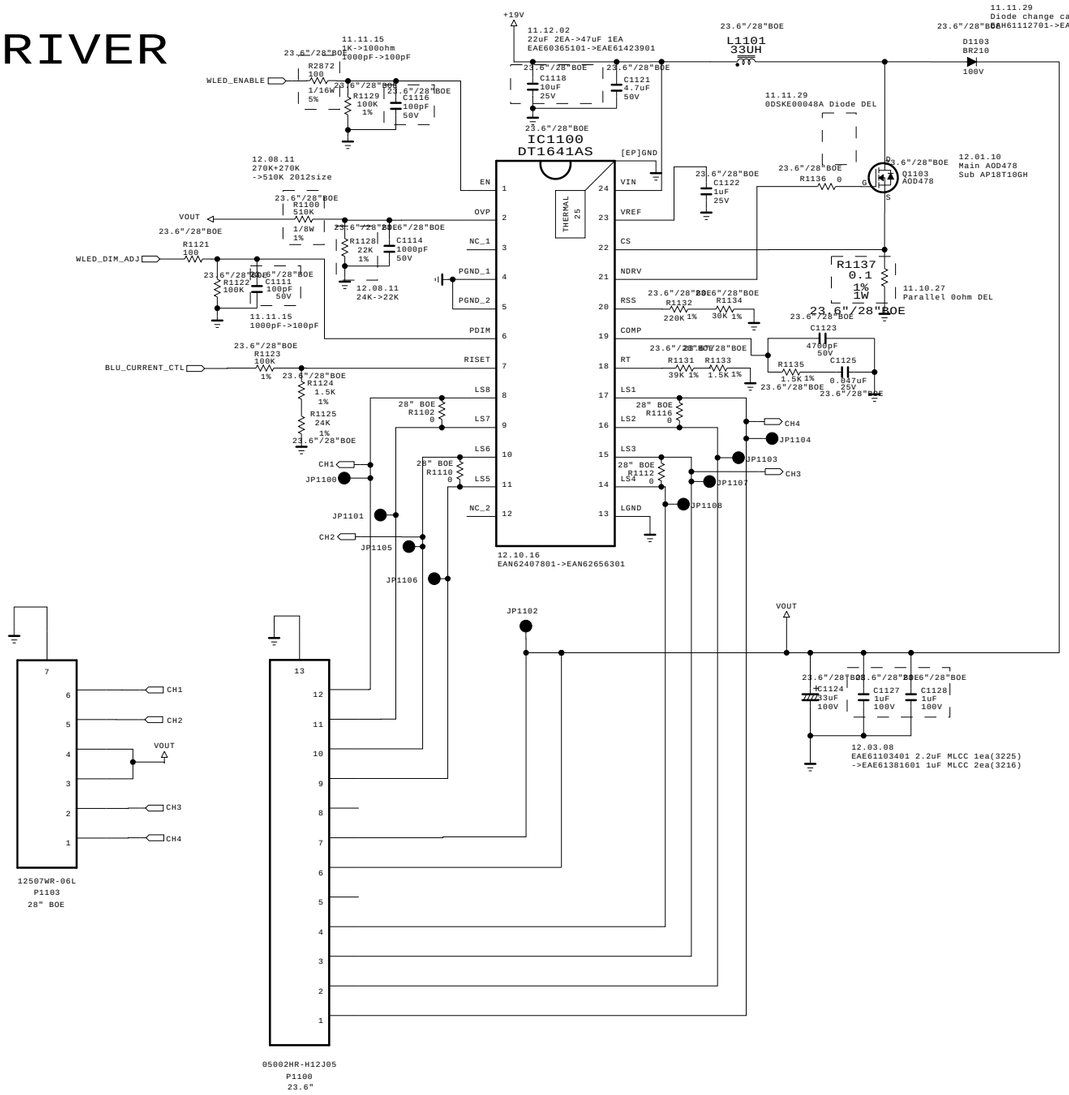
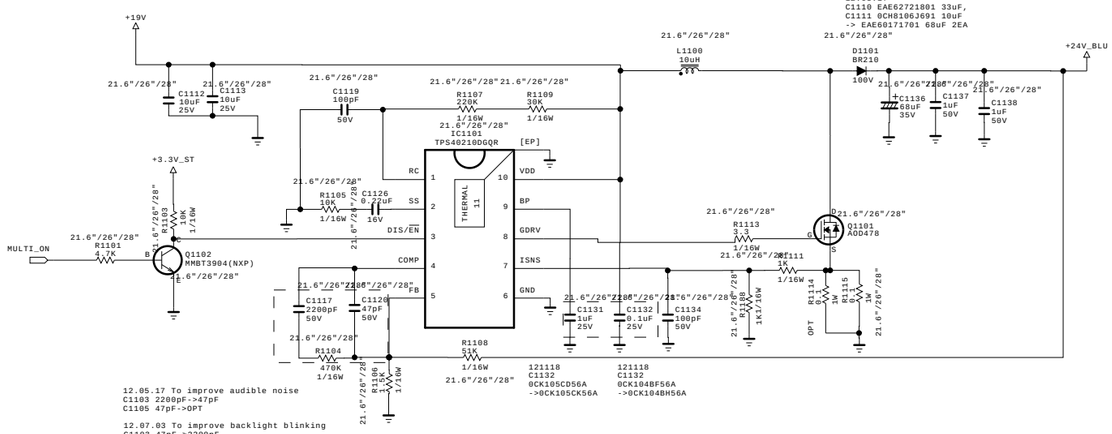
LED DRIVER





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EAX65359601_EU_22"/24"/28"

MODEL	NC4_S7LRM	DATE	2013.05.25
BLOCK	LED DRIVER	SHEET	11 / 12

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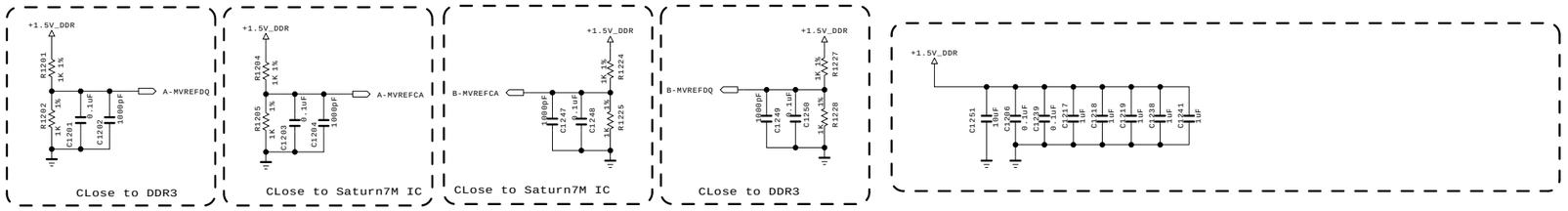
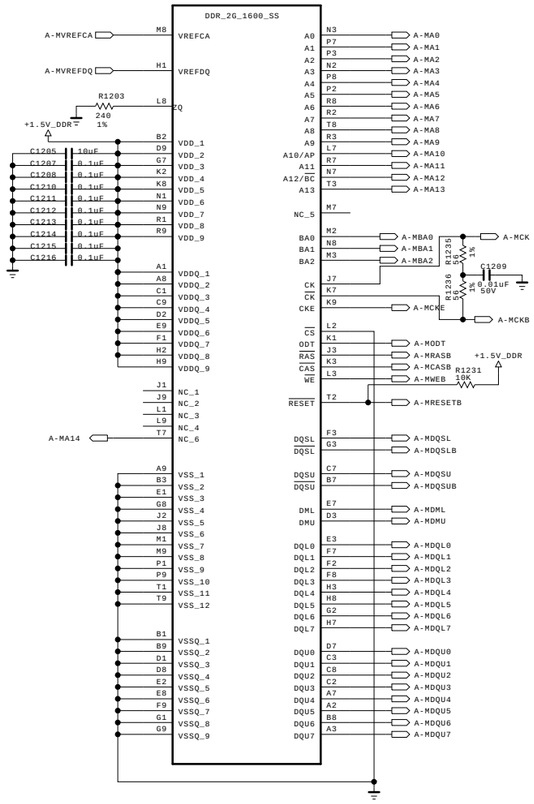


EAN61848802

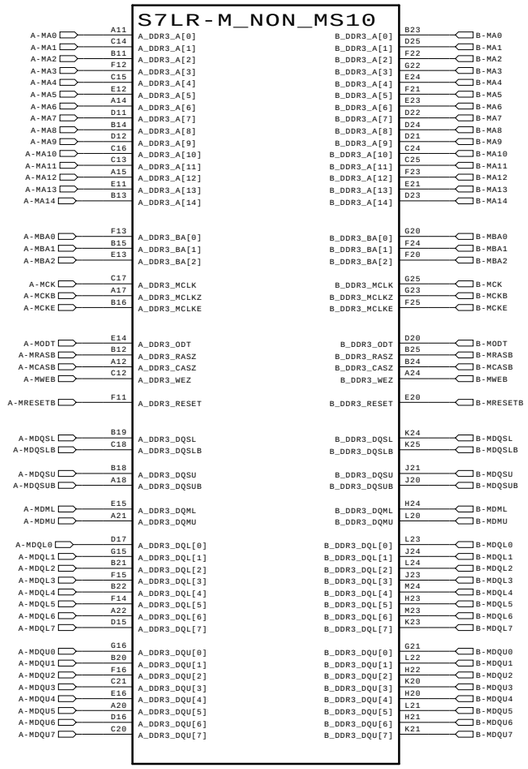
IC1201
K4B2G1646E-BCK0

DDR_2G_1600_SS



IC101
MSD804KKX

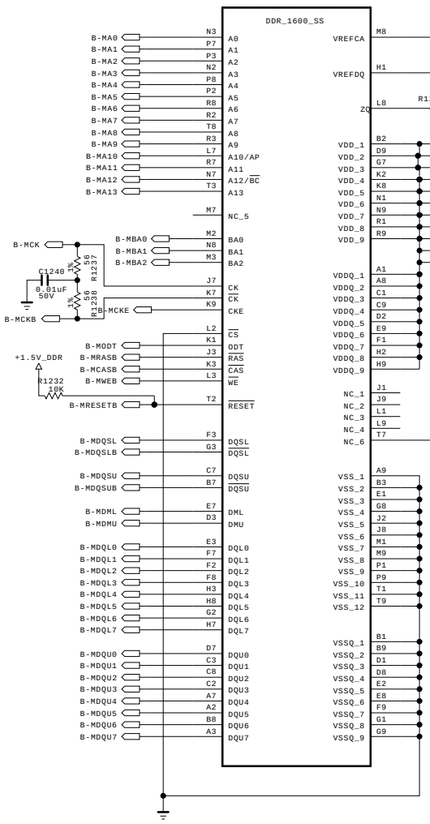
S7LR-M_NON_MS10



EAN61836301

IC1202
K4B1G1646G-BCK0

DDR_1600_SS



1G 1600

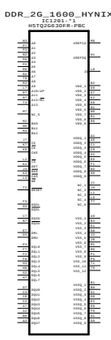
DDR_1600_HYNIX_9003(DEV)

IC1202-T1
H5TQ1G63EFR-PBC

2G 1600

DDR_2G_1600_HYNIX

IC1201-T1
H5TQ2G63EFR-PBC



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EAX65359601

MODEL	NC4_S7LRM	DATE	2013.5.5
BLOCK	DDR	SHEET	12 / 12

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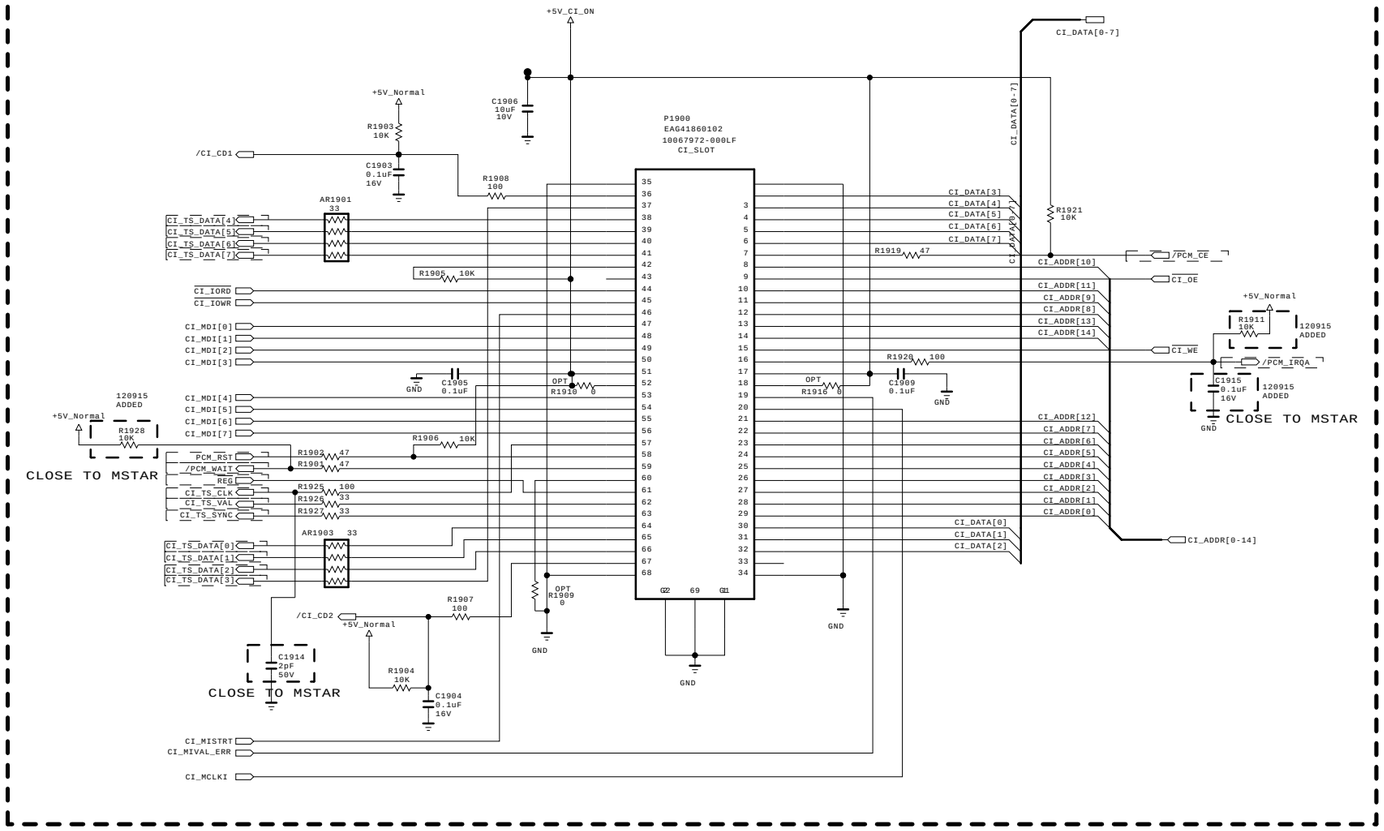
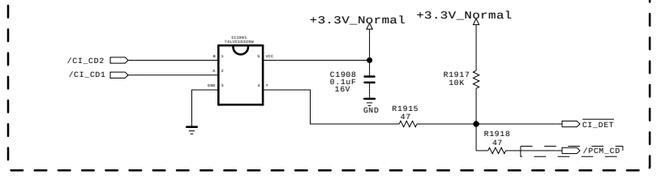
CI Region

CI SLOT

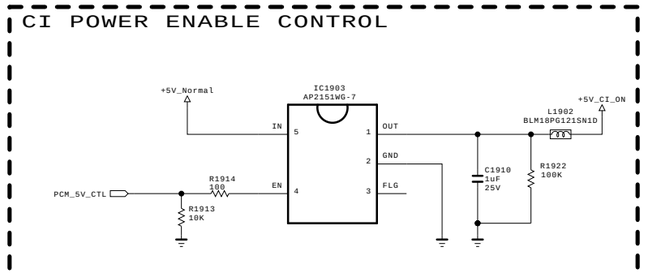


CI DETECT



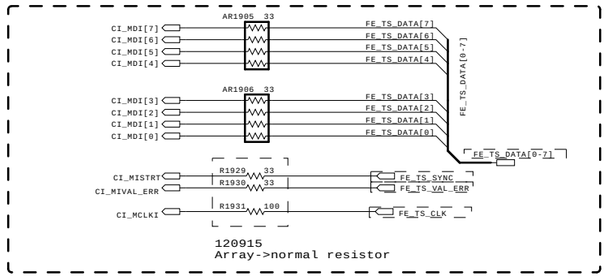
121022 Swich block change
FET->IC

CI POWER ENABLE CONTROL



* Option name of this page : CI_SLOT
(because of Hong Kong)

CI TS INPUT

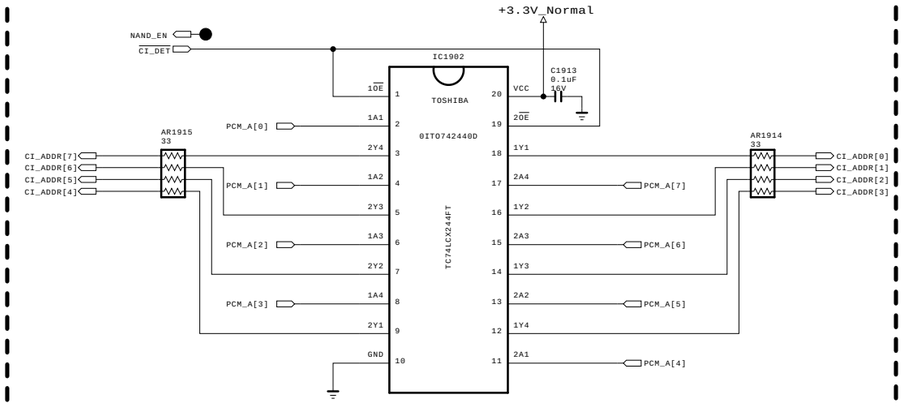


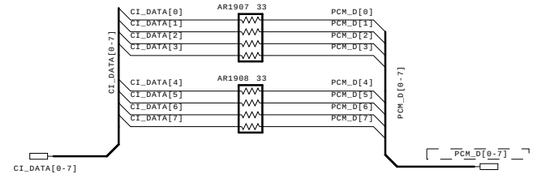
120915
Array->normal resistor

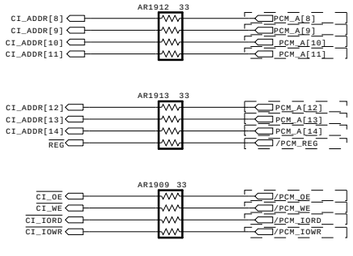
120915 BufferIC change
0ITO742440D
->0ISTLPH048A

121022 BufferIC change
0ISTLPH048A
->0ITO742440D

CI HOST I/F







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EAX65359601

MODEL	NC4_S7LRM	DATE	2013.5.5
BLOCK	PCMCI	SHEET	19 / 12

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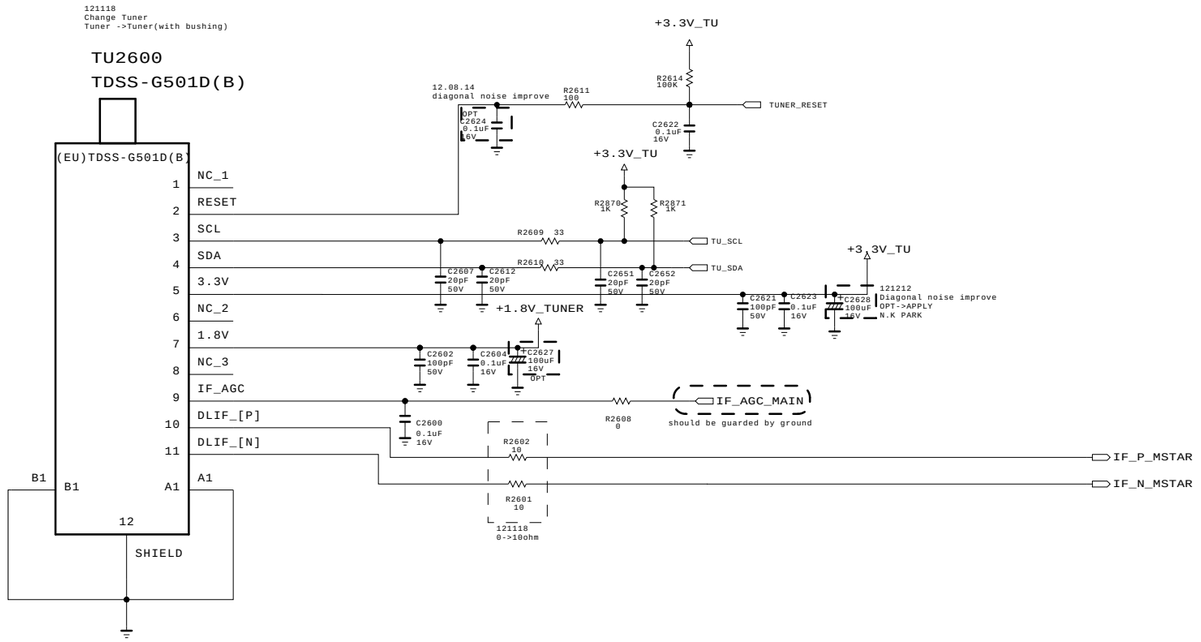
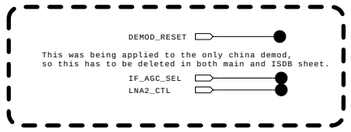
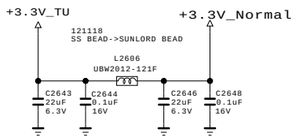
NETCAST4.0 EU(DVB-T/C)_TUNER_BLOCK




DEMOD_RESET
This was being applied to the only china demod,
so this has to be deleted in both main and ISDB sheet.
IF_AGC_SEL
LNA2_CTL



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EAX65359601_EU_22"/24"/28"

MODEL	NC4_S7LRM	DATE	2013.05.25
BLOCK	TUNER_EU	SHEET	26 / 12

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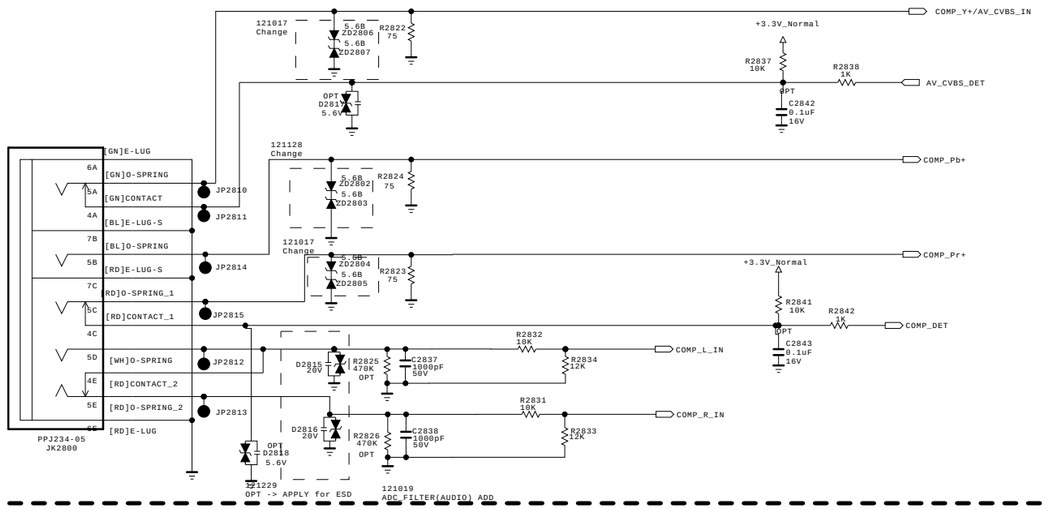
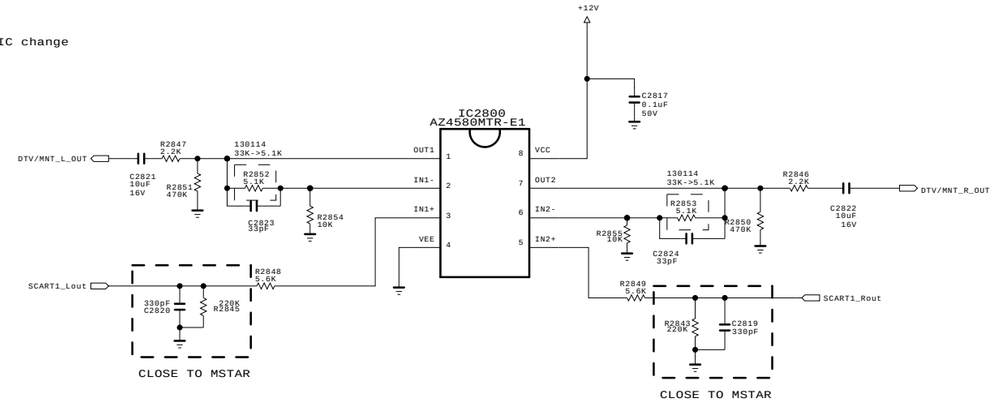
SCART / COMPONENT&CVBS

COMPONENT&CVBS

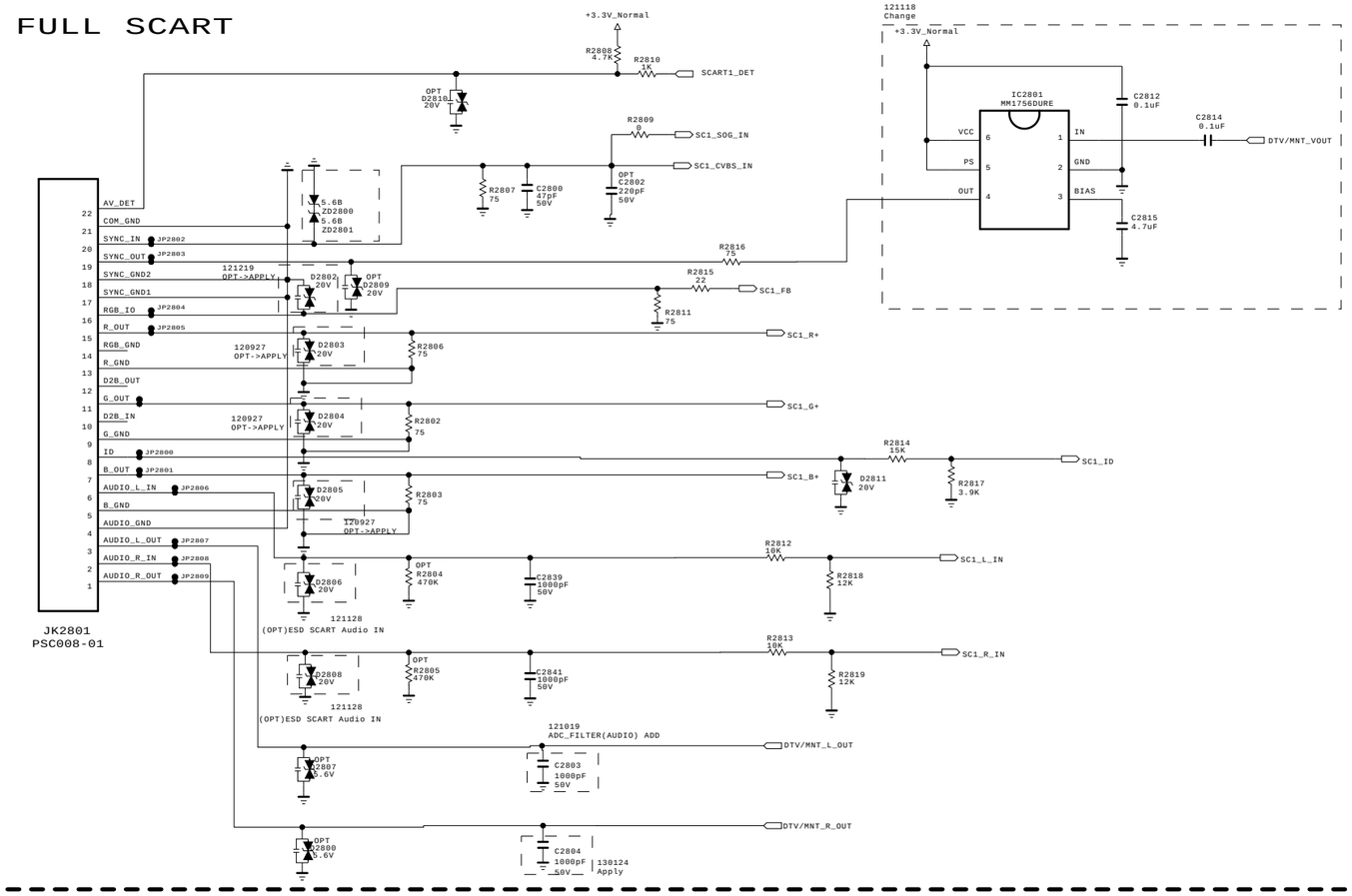


SCART AMP

121118
SCART AMP IC change



FULL SCART



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EAX65359601_EU_22"/24"/28"

MODEL	GP4L_S7LR2	DATE	2013.05.25
BLOCK	SCART&COMP	SHEET	28 / 12

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